33rd Year

NOVEMBER, 1949

RUBBER AGE

DO YOU WANT...A SUPER-FINE PARTICLE SIZE TALC...?

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NYTAL 200 Residue—2% on 325 mesh

NYTAL 300 Residue—Trace

NYTAL 400 Residue—None

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GOUVERNEUR TALC CO., GOUVERNEUR, N. Y.

R. T. VANDERBILT CO. INC.

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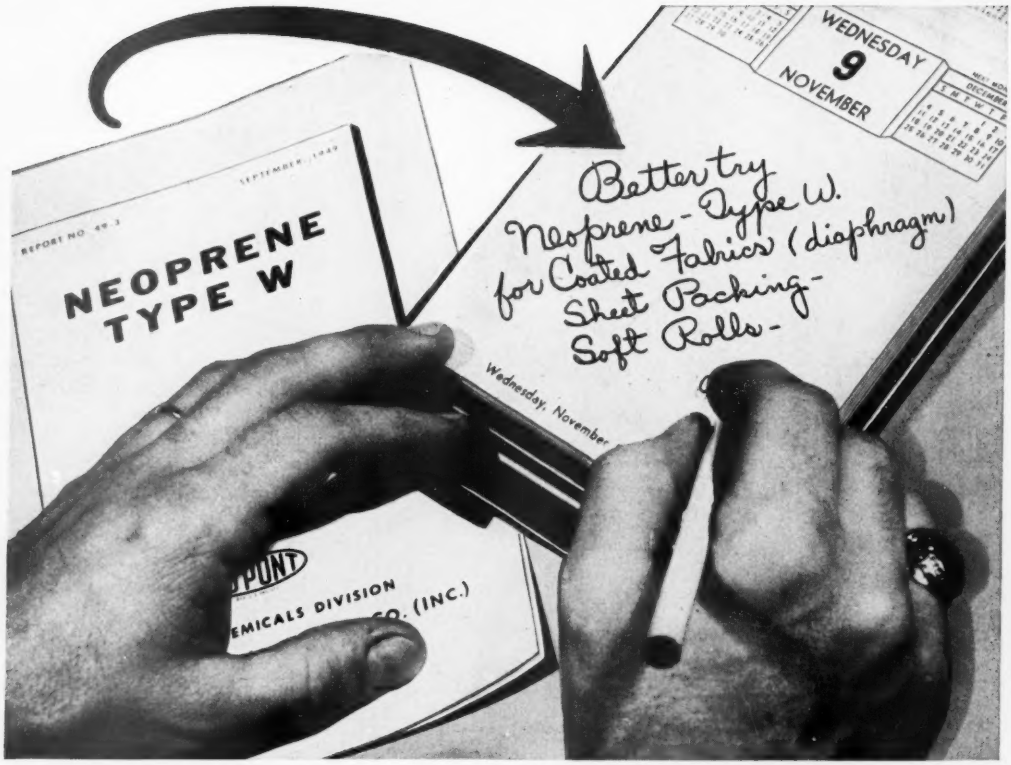

Neoprene Type W has ideal processing properties for the stocks this compounder is thinking about. Du Pont's new general-purpose neoprene readily forms a smooth sheet in which compounding ingredients can be dispersed quickly and uniformly. It has excellent resistance to mill breakdown; won't stick to mill and calender rolls even at high temperatures.

Tests show that plasticity, processability, scorching tendency and cure rate of Type W are practically unaffected *even after two years of normal storage.*

Type W can be vulcanized with conventional rubber accelerators and sulfur. Or, like the other neoprenes, it can be cured without sulfur. With this flexibility in compounding, cure rates can be varied over a wide temperature range with less effect on processing safety.

Try Neoprene Type W at your first opportunity and check its many advantages for yourself. Samples are available on request. Just write:

E. I. du Pont de Nemours & Co. (Inc.), Rubber Chemicals Division, Wilmington 98, Del.

. . .

Tune in to Du Pont "Cavalcade of America," Tuesday Nights—NBC Coast to Coast

● For complete information on Neoprene Type W, see Report 49-3. Ask for your copy if you haven't received one. See your Du Pont representative or send us your request.

DU PONT RUBBER CHEMICALS

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BETTER THINGS FOR BETTER LIVING...THROUGH CHEMISTRY

THE RUBBER AGE, published monthly by the Palmerton Publishing Co., Inc., Printing Office, East Stroudsburg, Pa. Editorial and Advertising Offices at 250 West 57th Street, New York 19, N. Y. Entered as second class matter October 20, 1933, at the Post Office at East Stroudsburg, Pa., under the Act of March 3, 1879. Subscription in United States, $3.00 a year; Canada, $3.50; Foreign, $4.00. November, 1949, Vol. 66, No. 2.

◀ *Hycar Packing Unit*

Packing unit molded from Hycar by Kirkhill Rubber Co., Los Angeles, California

Swivel joints made by Chiksan Co., Brea, California

How to twist a pipe, yet keep it leak-proof

TRANSFERRING liquified petroleum gas from tank cars to ships used to be a tough job. Discharge pipes couldn't be twisted or turned to hit the right spot, at just the right angle.

But an easy way to do the job was found after two tricky problems were licked. One problem went by the boards when the Chiksan Ball Bearing Swivel Joint was developed. This unique joint makes it possible to twist and turn pipe to just about any angle. The other problem—leak-proofing the joint—was solved with a packing unit made with Hycar American rubber.

The Hycar Packing Unit, a flexible seal between the metal parts, exhibits minimum volume change under service conditions. It effectively stops leakage of gas or liquid flowing from one section to another. Swivel joints are used successfully wherever gases or liquids are transferred or transported—such as refineries, chemical plants, dairies, food processing plants, bottling works and canneries.

Hycar was chosen for the leak-proofing job because it has such a wide range of qualities. It is resistant to oil and gas, abrasion, and does not flow even under extreme pressures. Hycar compounds can be varied from extremely soft to bone hard, and made in many colors.

Hycar may be just what you're looking for to answer a problem . . . to make better, more saleable products. For Hycar is used as a base material . . . as a plasticizer for vinyl resins . . . as a modifier for phenolics . . . as an adhesive base . . . as a latex for coating or impregnating. Send for complete information. Just write Dept. HB-11, B. F. Goodrich Chemical Company, Rose Building, Cleveland 15, Ohio.

Hycar
Reg. U.S. Pat. Off.
American Rubber

B. F. Goodrich Chemical Company
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GEON polyvinyl materials • HYCAR American rubber • GOOD-RITE chemicals and plasticizers

Philistine – *One afraid of new ideas*

Philblack* O – *The best idea yet for making "cold" rubber tougher*

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In natural rubber, "cold" rubber, or GR-S, wherever abrasion resistance is paramount, use Philblack O. Send for a trial order today! Philblack O is available in bags or in bulk.

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PHILBLACK SALES DIVISION

EVANS BUILDING · AKRON 8, OHIO

Warehouses in Akron, Boston, Chicago and Trenton. West Coast agent: Harwick Standard Chemical Company, Los Angeles. Canadian agent: H. L. Blachford, Ltd., Montreal and Toronto.

Phillips 66

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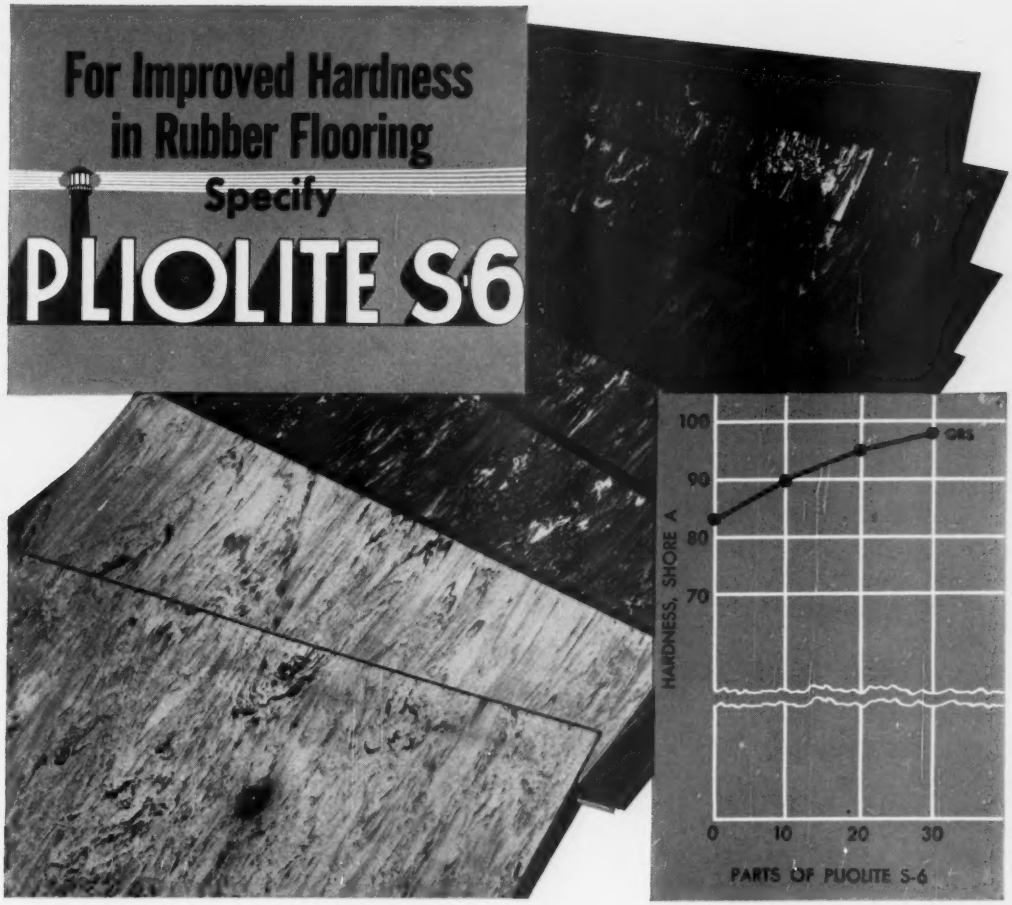
For Improved Hardness in Rubber Flooring

Specify

PLIOLITE S-6



RUBBER flooring must be hard and scuff- and abrasive-resistant to withstand long years of abusive service. The chart above shows how effectively loaded GRS stocks are hardened by reinforcement with **PLIOLITE S-6.**

Experience proves that when **PLIOLITE S-6** and mineral fillers are used in combination, very high hardness values can be obtained in stocks that still retain excellent toughness and durability.

Another important advantage of **PLIOLITE S-6** is the fact that it helps to eliminate scrap. It acts as a plasticizer at elevated temperatures, improving calendering and plate polishing. As the stock cools, **PLIOLITE S-6** prevents shrinkage.

You will find **PLIOLITE S-6** well suited to all compounds needing a light-color, low-gravity stock of 70-100 durometer hardness with good processing characteristics and moldability. It is highly desirable as a substitute for carbon black, since it reinforces natural and synthetic rubbers in colored as well as black stocks.

PLIOLITE S-6 is available as a powder for your own mixing, or in master batches in whatever synthetic you select. For complete information and sample, write: Goodyear, Chemical Division, Akron 16, Ohio.

USE PROVED *Products*

GOODYEAR

Pliolite—T. M. The Goodyear Tire & Rubber Company

New answer to the "scorch problem" ..in tire tread processing

HERE'S a new and successful accelerator-retarder combination for rubber compounders. It permits use of *all* the advantages of reinforcing furnace blacks in natural rubber tire tread formulations— *without scorching.*

And, it provides these additional advantages:

1. Low heat build-up.
2. Good flex life and high abrasion resistance.
3. Improved resilience and compression set.
4. Easy handling and processing.

Good-rite Erie is an excellent delayed action accelerator. Good-rite Vultrol is a highly effective retarder at processing temperature.

Send for complete information about these widely and successfully used rubber chemicals. Please write Dept. CB-6, B. F. Goodrich Chemical Company, Rose Building, Cleveland 15, Ohio.

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GEON polyvinyl materials • HYCAR American rubber • GOOD-RITE chemicals and plasticizers

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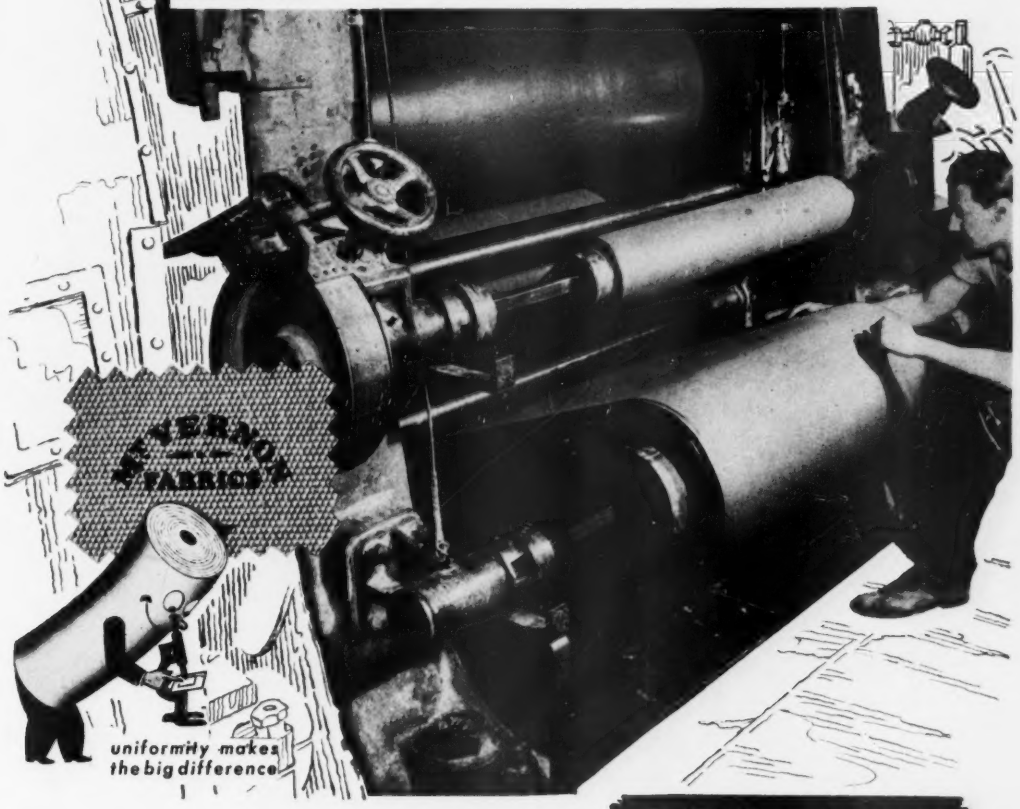
Uniformity of the fabrics you use means a great deal to the smooth, uninterrupted operation of your calendering machines. . . .

That's why Mt. Vernon fabrics are a favored choice wherever calendering is done. . .

Every step in the spinning and weaving of Mt. Vernon is rigidly laboratory-controlled—to insure consistently higher uniformity—to give you uniform absorption, strength, toughness, resiliency—to give you smoother, faster calendering.

For fabric quality that reflects itself in the products you make—specify Mt. Vernon.



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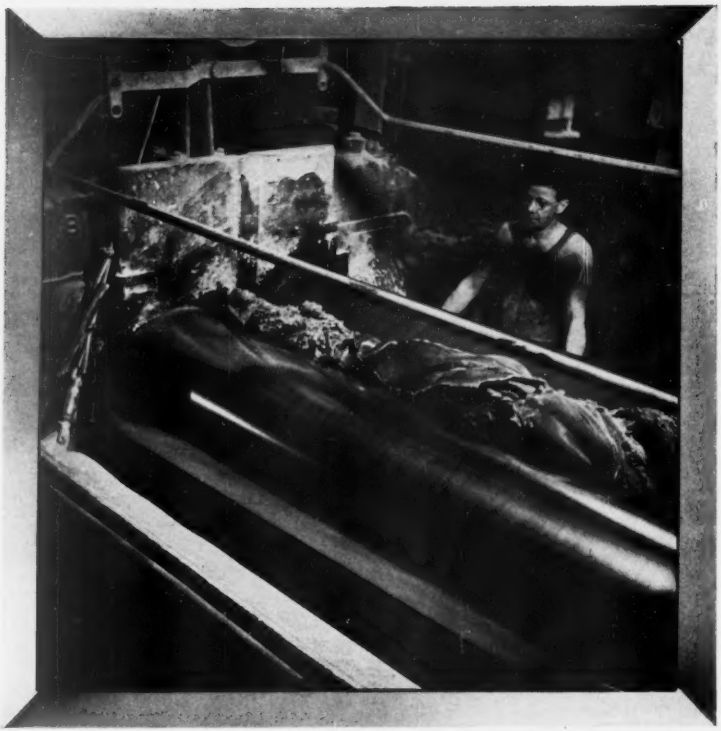

IS MASTERBATCHING OR COMPOUNDING a problem in YOUR plant?

—Suppose your mixing equipment breaks down.
—Suppose you could bid on big jobs but don't have sufficient facilities.
—Suppose your color compounding is being jeopardized by carbon black.

PEQUANOC CAN HELP YOU OUT

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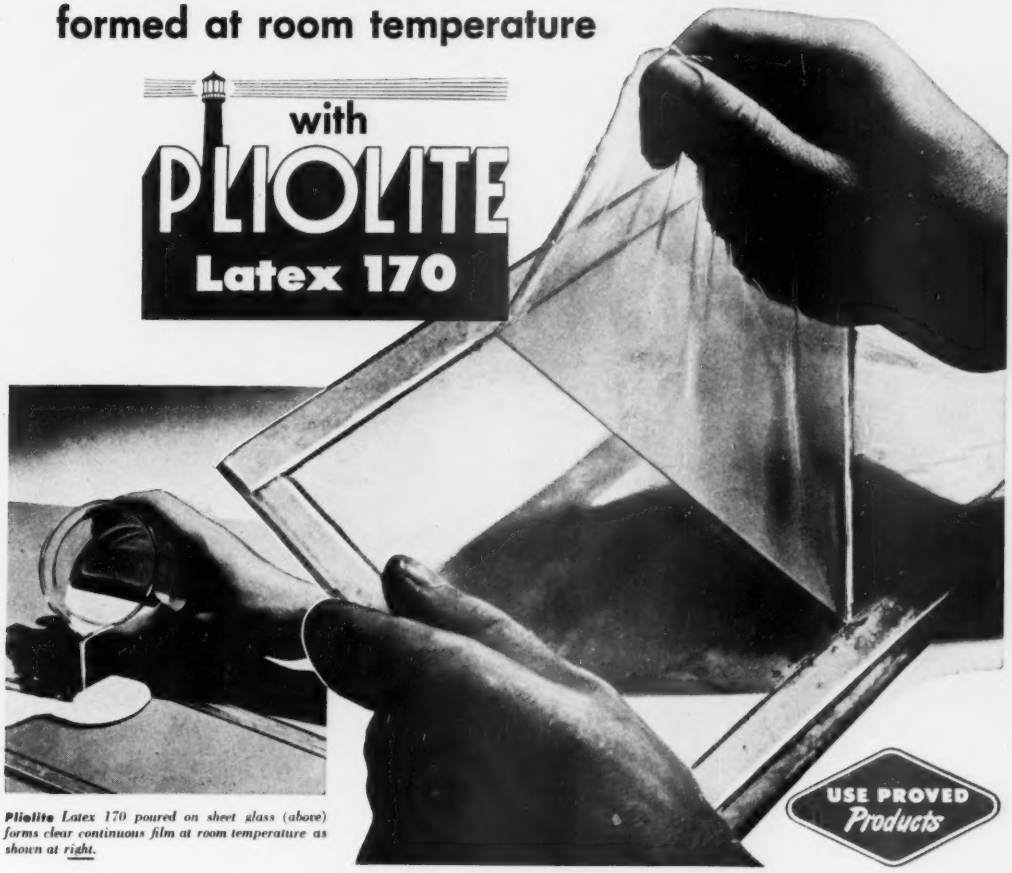
Tough, abrasion-resistant films

formed at room temperature

with

PLIOLITE

Latex 170



Pliolite Latex 170 poured on sheet glass (above) forms clear continuous film at room temperature as shown at right.

USE PROVED *Products*

ANOTHER in the family of Goodyear resinous latices, **Pliolite Latex 170** will form continuous films at room temperature without plasticization. They're tough, abrasion-resistant, chemical-resistant—can be compounded to be water- vapor-proof and resist oils and greases. **Pliolite Latex 170** can be modified with other **Pliolite** latices to develop specific properties as desired by users.

Potential uses of this quick-drying resinous latex are in the development of coatings for papers, fabrics and leather; as a base or additive for water emulsion paints; and as a sealer for plaster, wood, composition wallboard and other materials.

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Goodyear, Chemical Division
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Pliolite—T.M. The Goodyear Tire & Rubber Company

GOODYEAR

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PANAFLEX BN-1

will do the job better – at a substantially

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PANAFLEX BN-1 is an economical, light-colored plasticizer for synthetic rubber – especially butadiene-acrylonitrile type.

This new hydrocarbon plasticizer *completely* replaces dibutyl phthalate in nitrile rubbers – produces soft vulcanizates having high tensile, excellent elongation, and very low modulus. **PANAFLEX BN-1** plasticized stocks possess good ageing properties, superior electrical characteristics, and show good gasoline and oil resistance.

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SPECIFIC GRAVITY	0.9440
COLOR, NPA	1½
REFRACTIVE INDEX	1.553
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ODOR	Excellent
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Pan American Refining Corp

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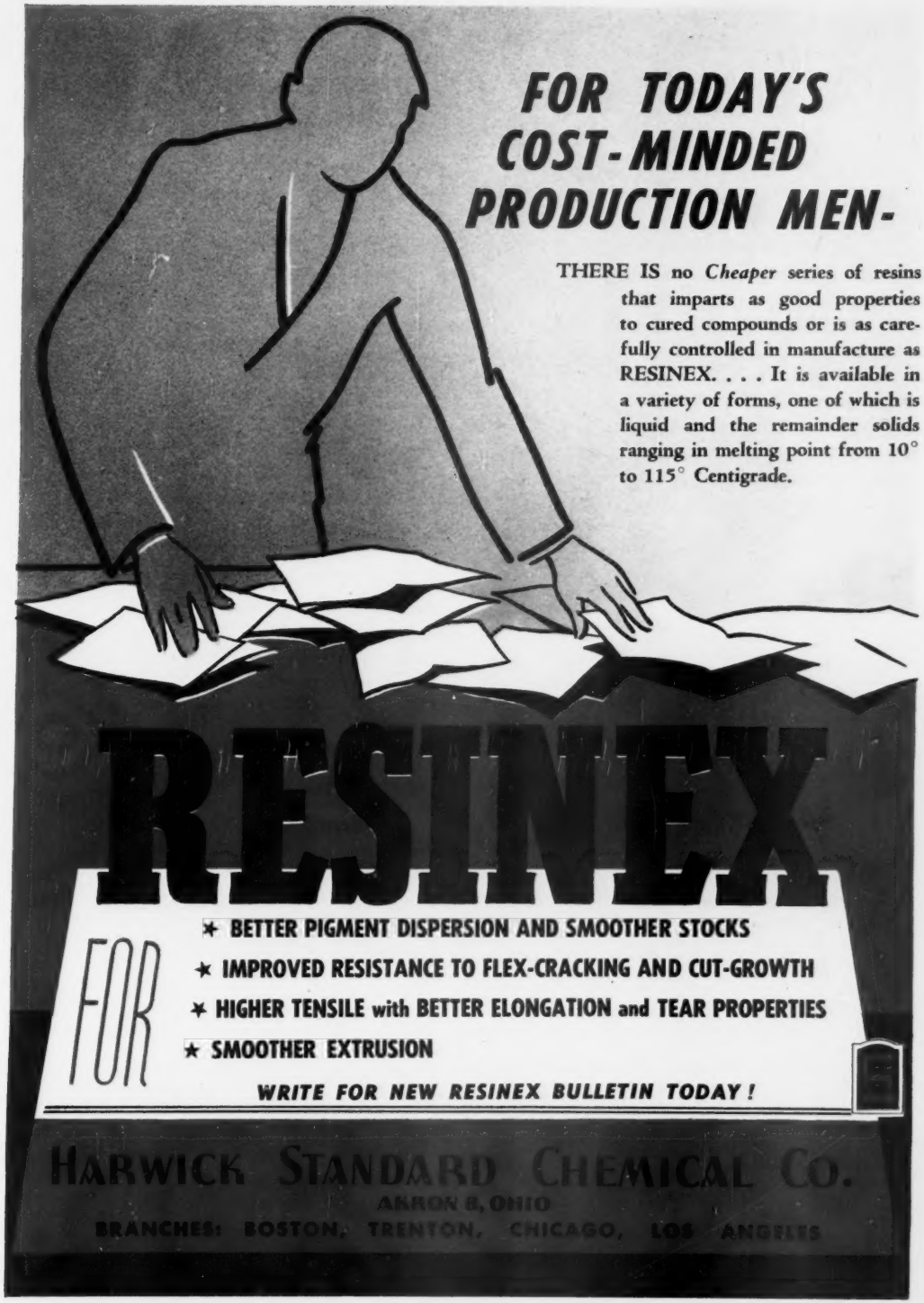
PAN AMERICAN

Plant
Texas City, Texas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SANTICIZER 141, compatible with most common base resins, is especially effective in polyvinyl chloride, polyvinyl co-polymers and Buna-N type synthetic rubbers. It is a non-toxic plasticizer imparting low-temperature flexibility, toughness and resistance to flame, moisture, oil and abrasion. It improves heat and light stability.

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Santicizers 141 and 160 are but two of a long list of Monsanto Plasticizers, each having definite functions in plastics, coatings or rubber. Santicizers have excellent processing characteristics for films, coatings, extrusions or molded products. New low prices offer you production economies. Look into the advantages you can gain from using Santicizers. For complete details, quotations and samples, mail the coupon, contact the nearest Monsanto Sales Office or write: MONSANTO CHEMICAL COMPANY, Rubber Service Department, 920 Brown Street, Akron 11, Ohio.

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Santicizer® 160 (Butyl benzyl phthalate)
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Triphenyl Phosphate
Santicizer 140 (Cresyl diphenyl phosphate)
Santicizer 141 (an alkyl-aryl phosphate)
Santicizer 3 (N-ethyl para toluene sulfonamide)
Santicizer 8 (Mixture of N-ethyl ortho and para toluene sulfonamides)
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MONSANTO CHEMICAL COMPANY
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The rubber company's original formula called for a blend of 5 separate colors—one of them organic. Working from this formula, C. K. Williams & Co. developed two blends of less expensive inorganic pigments. These two blends consisted of 4 colors—and were basically stable, permanent iron oxides.

The recommended pigmentations were checked in the Williams laboratory for perfect color matching—and also for such physical characteristics as tensile strength, tear resistance, and oxygen bomb aging.

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For complete information address Dept. 8, C. K. Williams & Co., Easton, Pa.

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4. A milling capacity large enough to fill all orders promptly—regardless of size.
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Baldwin Steam Platen Presses are invaluable aids in many process industries. They turn out top-quality products, reduce costs through production speed, assure profits through dependable performance. The design of these Baldwin Presses is the result of years of research and development, reinforced with practical experience gained in the field.

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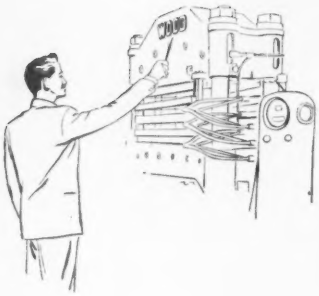
HYDRAULIC PRESSES

the wisdom of doing business with R. D. Wood



The industrial buyer today is looking more and more closely at the comparative feature-for-feature value of the products he buys.

It has become increasingly necessary for his purchases to justify themselves on the basis of sound business economy—for increased production, better quality in output, rapid self-amortization, or some similar factor.

This situation is healthy. In fact, it fosters the competition desirable under the American free enterprise system.

Under this system, those industrial products which have maintained high excellence in manufacture will continue to be sold, and will contribute their worth to uplifting the general quality of everything produced in industrial America.

We at R. D. Wood have believed in this principle—and manufactured by it—since our Company was founded back in 1803. Our hydraulic presses and equipment for the metalworking, plastics, rubber, and plywood industries have always withstood alert purchasing scrutiny. We have invited, and will continue to invite, feature-by-feature examination and comparison of our products.

You'll never find an inferior piece of hydraulic equipment with the name WOOD on it. We have found that in almost 150 years of doing business, this type of unrelenting policy is nothing less than wisdom.

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Write for R. D. Wood catalogs on hydraulic presses and equipment

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"G" RESIN
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465 RESINS
Colors
From pale amber to dark brown
Melting Point
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RECLAIMING, PLASTICIZING, NEUTRAL, CREOSOTE, AND SHINGLE STAIN OILS

Chemicals you live by

When You Want Good Dispersion

Have dispersion problems hindered incorporation of calcium carbonates in your plastic or rubber products? Try these two steps:

1. Select one of our three MULTIFEX* grades of precipitated calcium carbonate.
2. Prepare concentrated master batches first, then cut back this mixture by the addition of more plastic or rubber until the desired loading is reached.

Particle size of MULTIFEX is .03 to .04 microns, but due to its uniformity and purity, power requirements for mixing this ultra-fine particle size pigment are comparatively low.

SUPER MULTIFEX has the same particle size as MULTIFEX. It is double coated (before and after drying) with organic compounds which act as lubricants, aiding dispersion.

MULTIFEX MM has a particle size of .05 to .06 microns and is available with or without a dry coating. Larger particle size provides more complete dispersion and in many instances results in quality equal to the finer grades.

If you wish more information on these non-abrasive, precipitated calcium carbonates, get in touch with your nearest DIAMOND Sales Office. DIAMOND'S Technical Service Staff is also available to assist you in any compounding problems. *®

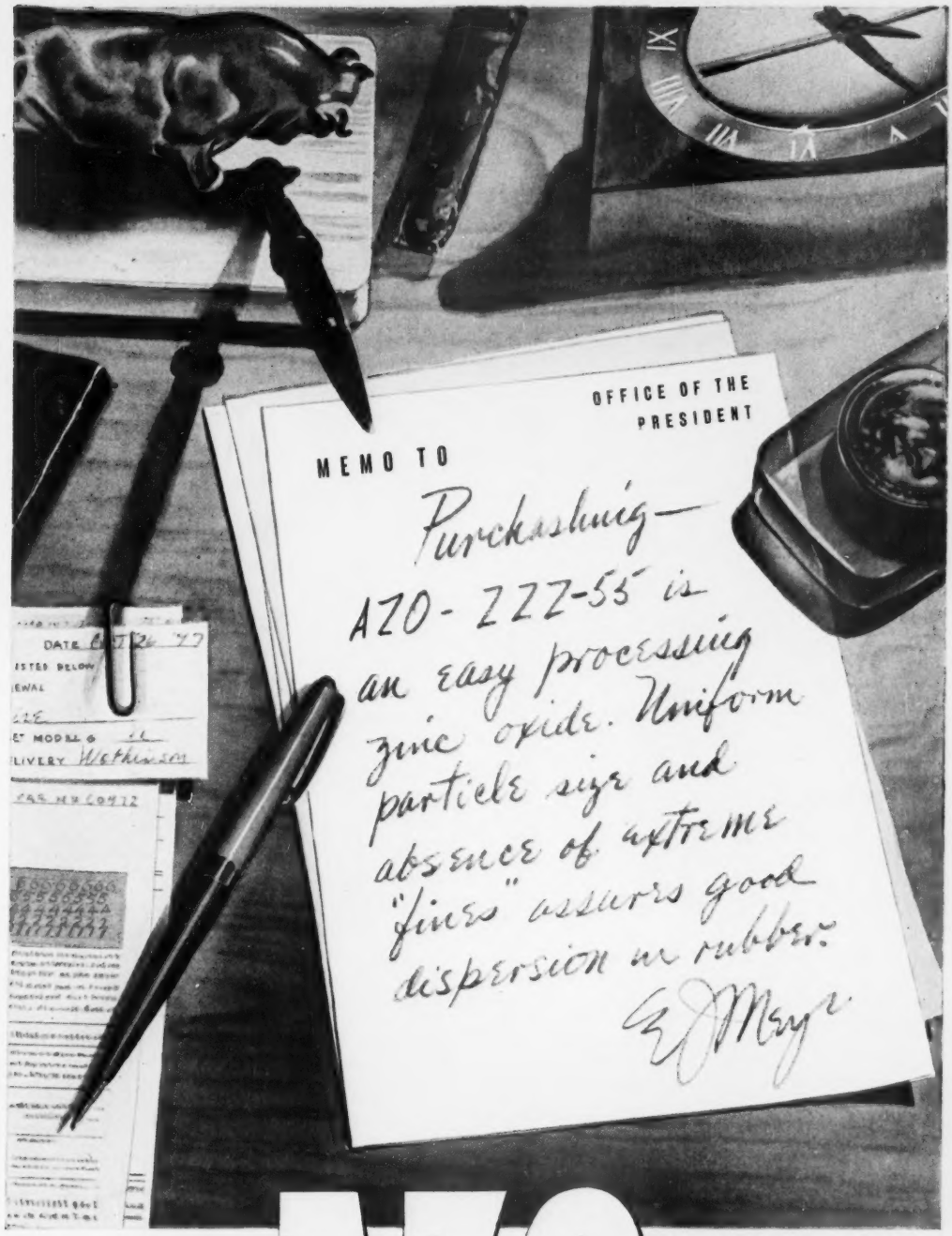
DIAMOND SALES OFFICES: Boston, New York, Philadelphia, Pittsburgh, Cleveland, Cincinnati, Chicago, St. Louis, Memphis, Wichita, Oklahoma City and Houston.

DIAMOND DISTRIBUTORS: C. L. Duncan Co., San Francisco and Los Angeles; Van Waters and Rogers, Inc., Seattle and Portland, U. S. A.; Harrison and Crofield, Montreal and Toronto, Canada.

DIAMOND MULTIFEX* COMPOUNDS

DIAMOND ALKALI COMPANY . . . CLEVELAND 14, OHIO

DIAMOND ALKALI CHEMICALS



Uniform-Dependable

AZO ZINC OXIDES

AMERICAN ZINC SALES CO.

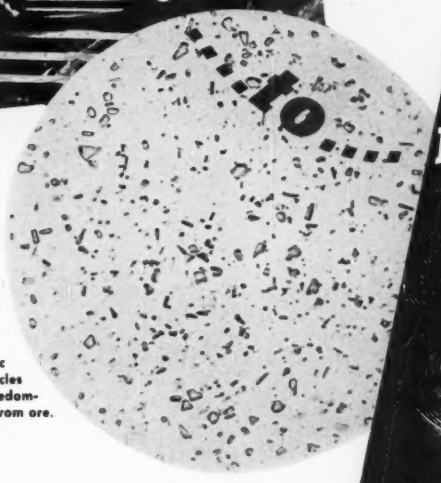
Distributors for

AMERICAN ZINC, LEAD & SMELTING CO.

COLUMBUS, OHIO · CHICAGO · ST. LOUIS · NEW YORK

Everything under control

A view in the Balmat zinc mine of the St. Joseph Lead Company where the broken ore is screened by a steel "grizzly." This "grizzly" is the first screening operation incident to zinc oxide manufacture. The broken ore drops between the steel beams and falls into the underground chute from where it is hoisted to the concentrating mill for further processing.



Photomicrograph of St. Joe Zinc Oxide. The crystal-shaped particles shown are characteristic and predominate in pigments made direct from ore. *Mag. 1500x*

The consuming industries' preference for ST. JOE lead-free ZINC OXIDE is entirely due to the proved fact that—by virtue of its exceptional quality and uniformity—this pigment has established definitely higher standards for products in which zinc oxide is used as a raw material.

To a large degree, this achievement has been made possible by the one highly important factor: UNITY OF CONTROL IN PRODUCTION, FROM ZINC ORE TO ZINC OXIDE. The St. Joseph Lead Company owns and operates zinc mines at Balmat and Edwards, N. Y., and ST. JOE ZINC OXIDE is made direct from ores produced by an Electro-Thermic method, which is an improvement of the American Process. Thus, this Company's control in every step of production is coordinated to achieve higher standards of quality and uniformity. This superiority of ST. JOE lead-free ZINC OXIDES is recognized in the consuming industries by their extensive use of these pigments.

ST. JOSEPH LEAD COMPANY

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ST. JOE *lead-free* ZINC OXIDES

Serving the RUBBER INDUSTRY * with Satisfaction

Prevents adhesion of hot rubber slabs when piled . . . banishes dust nuisance by replacing soapstone or talc . . . prevents sticking during cure of extrusions and flat pan coiled tubing . . . excellent release agent for molds, mandrels, air bags, belt drums . . . equally satisfactory for washing and finishing inner tubes; imparts satiny finish . . . greatly aids in the processing of insulated wire and cable. The Production Departments and Laboratories of many rubber manufacturers, through years of using GLYCERIZED, give ample proof of its outstanding qualities as a lubricant for natural, synthetic and reclaimed stocks.

Also Mfgrs. of

* **RUBBEROL** AND **SYNTHOL** TWO OTHER FACTORY PROVED RUBBER PROCESSING AGENTS

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RUBBER MATERIALS DIVISION

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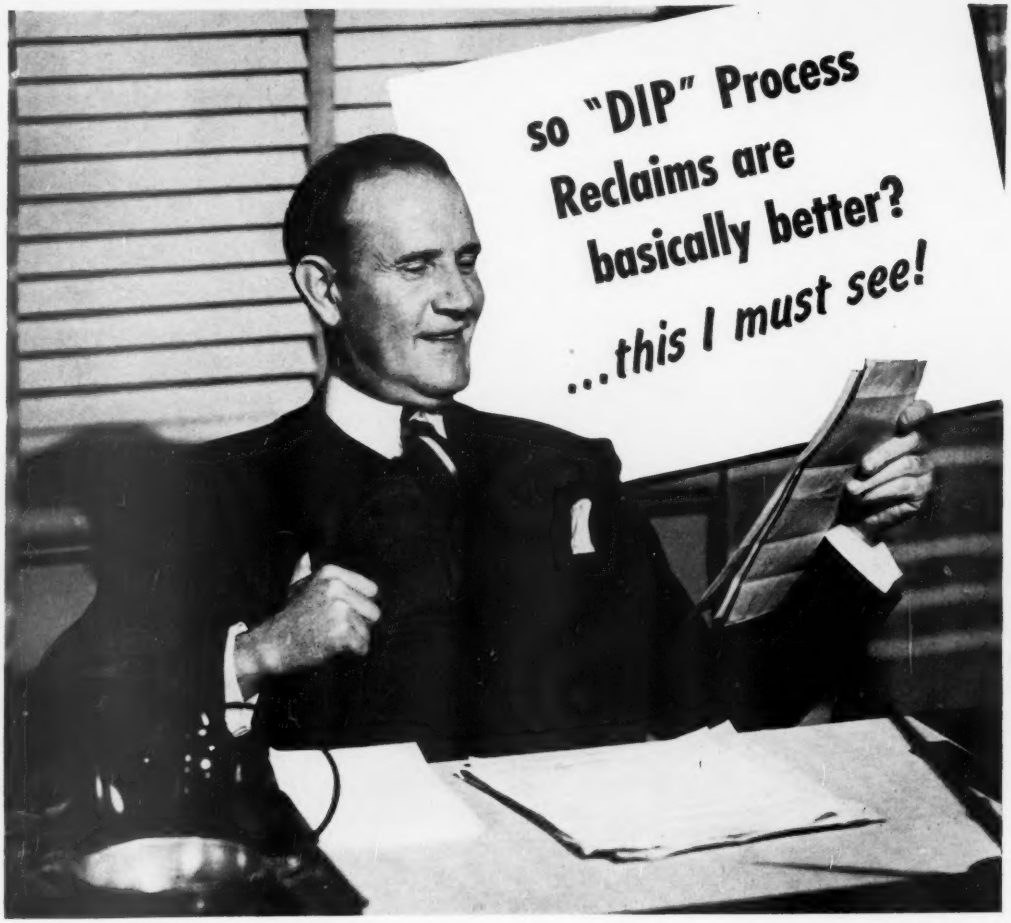

You'll see plenty that interests you Mr. Reclaim Buyer. Buffalo's new "DIP" process represents the *first basic improvement* in the reclaiming of rubber in fifty years . . . offers you definite advantages in economy, lower processing costs and improved quality in finished products.

Take our **IMPROVED WHOLE TIRE RECLAIM R-351** for example. Note these advantages:

***ECONOMICAL.** Absorbs more dry pigments and solid fluxes without deterioration or loss of valuable properties.

***REDUCES PROCESSING COSTS.** Faster breakdown—takes up compounds quicker. Permits higher Banbury loading due to *unique* properties inherent in "DIP" process reclaims. Tubes faster and smoother. Calenders flatter. Less nervy—less tendency to scorch.

***IMPROVES FINISHED QUALITY.** Increases resistance to abrasion. Provides greater flexibility. Gives a higher rebound test.

Yes, Mr. Reclaim Buyer, Buffalo's new "DIP" process reclaims are *basically better*—offer real advantages to you. Write us today for samples and full information.

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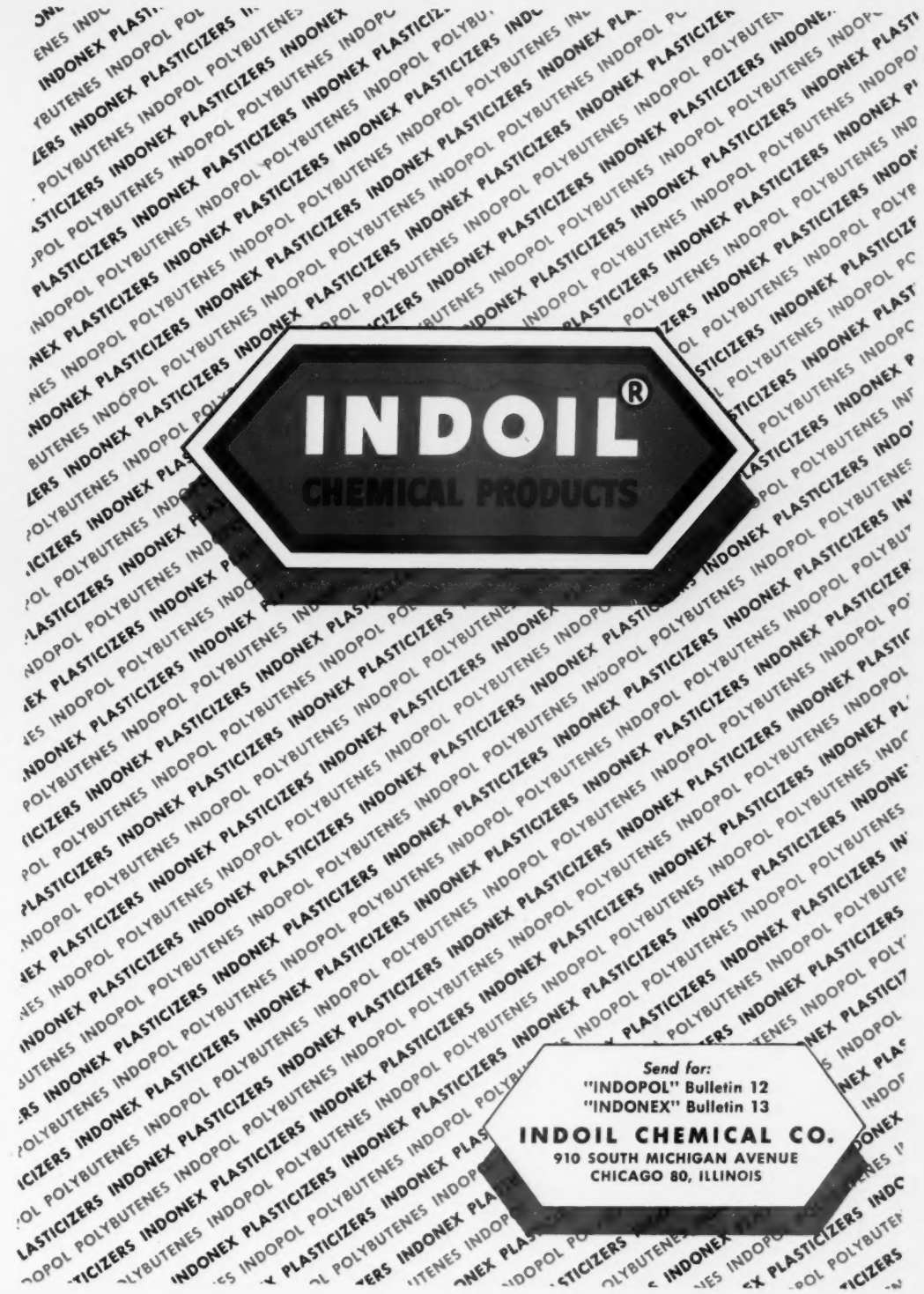
BUFFALO, N. Y.

Trenton—H. M. Royal, Inc., 689 Pennington Ave.

67 YEARS SERVING THE INDUSTRY SOLELY AS RECLAIMERS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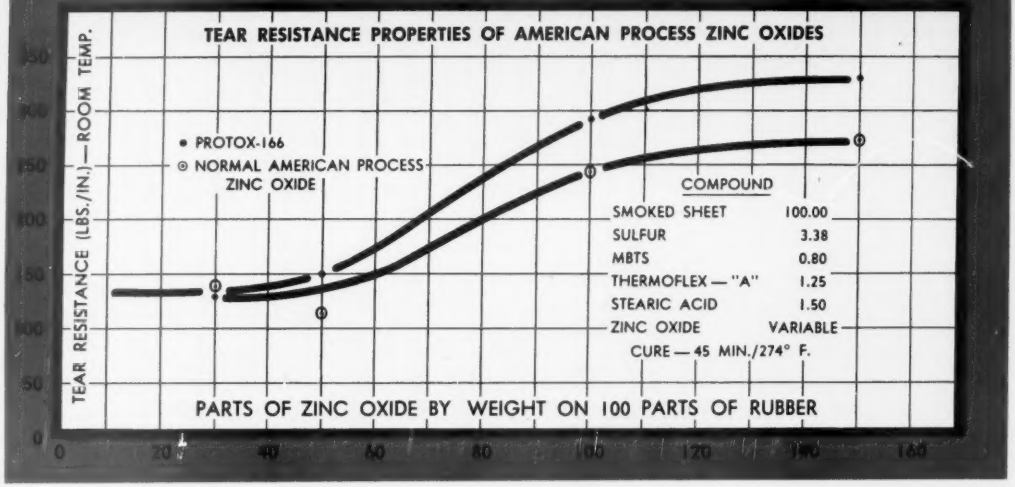
An Easier Way to Add More TEAR RESISTANCE:

PROTOX-166*

(THE COATED ZINC OXIDE)



Higher tear resistance properties of zinc oxides in rubber usually mean finer particle size . . . with slower mixing and more difficult processing.

Protox-166 is different. It imparts higher tear strength . . . yet mixes faster and aids processing more than do other American Process zinc oxides.

Better dispersion is the reason why Protox-166 provides more tear resistance. Better dispersion means more pigment-rubber interfacial area and fewer agglomerates to act as stress centers.

Protox-166 imparts more tear resistance, together with faster mixing and improved processing, because it is specially treated with propionic acid—resulting in a coating of zinc propionate.

If you are not yet using Protox-166, send for samples now.

*U. S. Patents 2,303,329 and 2,303,330

HORSE HEAD PRODUCTS

THE NEW JERSEY ZINC COMPANY

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CARBON BLACKS

UNITED CARBON COMPANY, INC.

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Kosmos 60 (an R F black) is an extraordinarily good black because of the way it is made and what it can do. Created from a particular oil and under controlled heat and reactions in our own furnace process, Kosmos 60 is fitted for easy and efficient processing, fast extrusion, less nerve, proper smoothness, tight cure, mighty reinforcement, high electrical conductivity and superb resistance to wear and flex crack cut-growth. Standardize on Kosmos 60 to give your products the supremacy they deserve.

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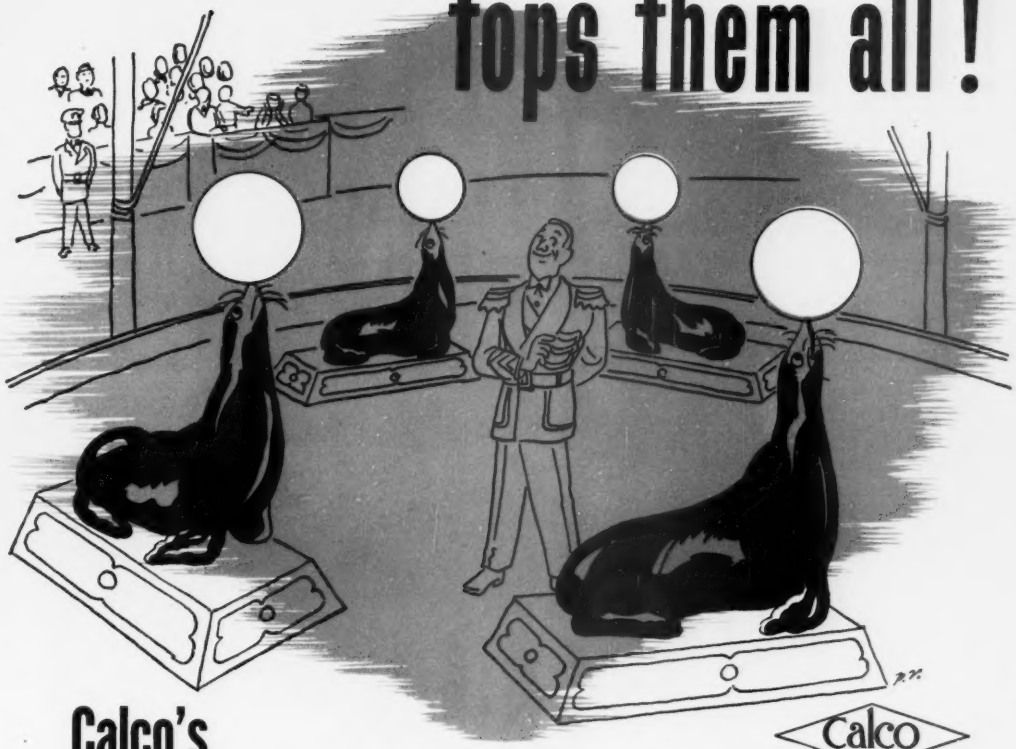

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Calco's unitane* 0-220 titanium dioxide gives maximum whitening at minimum cost

You secure maximum whitening effects with minimum loading —and cost—in your rubber products with UNITANE 0-220, the Anatase type Titanium Dioxide.

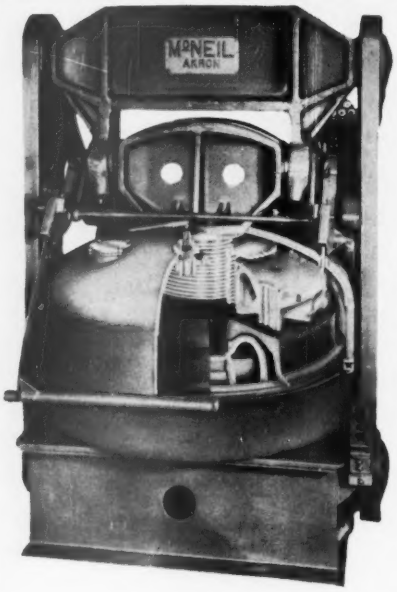
Specify it for brilliance in white and white-tinted articles.

Ask your Calco representative for information on type and grade of UNITANE best suited to your needs.

*Reg. U. S. Pat. Off.

AMERICAN Cyanamid COMPANY

CALCO CHEMICAL DIVISION
PIGMENT DEPARTMENT
BOUND BROOK, NEW JERSEY
Branch Offices and Warehouses in Principal Cities

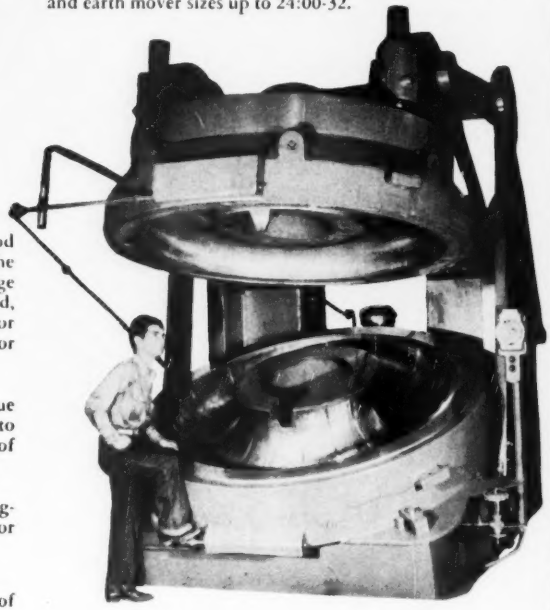


Model 675-65"-18D Single Tire Press

McNEIL

TIRE *and* TUBE CURING PRESSES IN POPULAR SIZES

Model 400 — 75" — 25, shown below, will handle the larger regular truck sizes, plus farm implement sizes and earth mover sizes up to 24:00-32.



Model 400 — 75" — 25 Tube Press

1

Labor and power saving. Our patented method for stripping any size of tire takes most of the work out of the job. One man can operate a large battery of presses. Very little power is required, as our electrically operated unit requires power for only a few seconds during each cycle, to open or close the press.

2

High production, resulting in lower costs due to almost continuous curing. One-half minute to two minutes for changes, depending upon size of tire being cured.

3

Wide range of flexibility and fast mold changing. Simple and rugged design of mechanism for adjustment to suit mold thickness.

4

Better cures, because of open steam method of curing, plus individual temperature and pressure control, plus cooling if desired. All presses are heavy duty type for high internal pressures.

All the experience and engineering skill of the McNEIL organization is at your call to help you increase efficiency and speed while lowering production costs. For tomorrow's production, check with McNEIL today.

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(rutile titanium dioxide)
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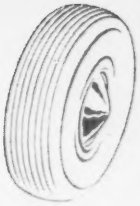

TITANOX-A
(anatase titanium dioxide)
— imparts maximum whiteness with low pigmentation.

TITANOX-RCHT
(rutile-caicium; 30% TiO_2, 70% $CaSO_4$)
— imparts maximum whiteness and brightness at higher pigmentation.

TITANOX pigments are ideal whiteners and brighteners for rubber because of high refractive index coupled with optimum particle size. Their physical and chemical stability make them compatible with natural and synthetic rubbers as well as compounding ingredients.

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the brightest name in pigments

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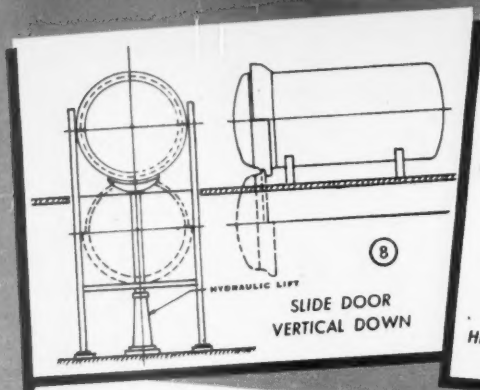
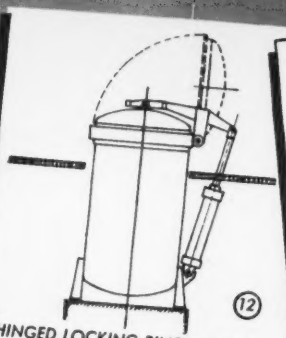
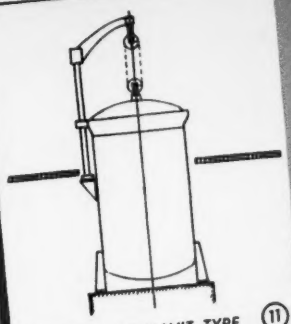


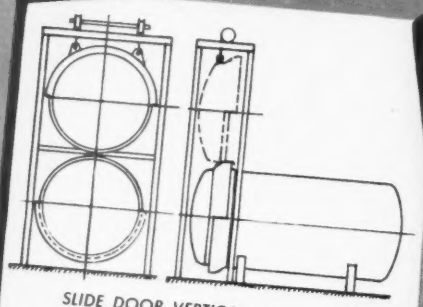
8 SLIDE DOOR VERTICAL DOWN



12 HINGED LOCKING RING DOOR PRESSURE OPERATED



BREECH LOCK DAVIT TYPE 11



SLIDE DOOR VERTICAL UP 5

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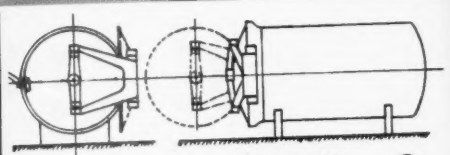
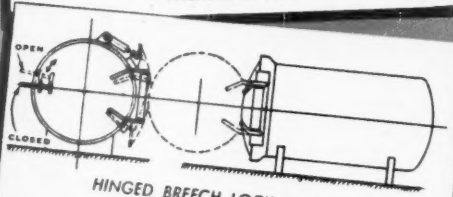
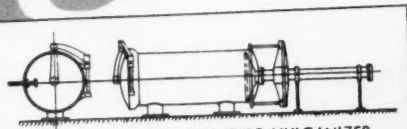


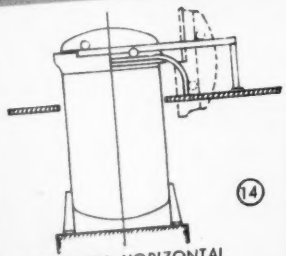
BREECH LOCK HINGED DOOR WISHBONE TYPE 2



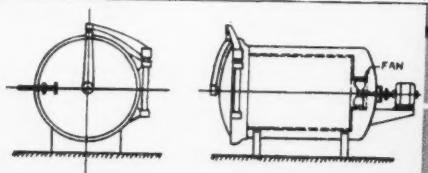
HINGED BREECH LOCK DOOR ARC HINGE TYPE 4



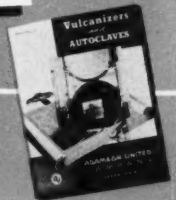
HORIZONTAL RAM TYPE VULCANIZER 16



14 SLIDE DOOR HORIZONTAL AND DOWN



HINGED BREECH LOCK DAVIT TYPE DOOR WITH INTERNAL AIR CIRCULATION 3



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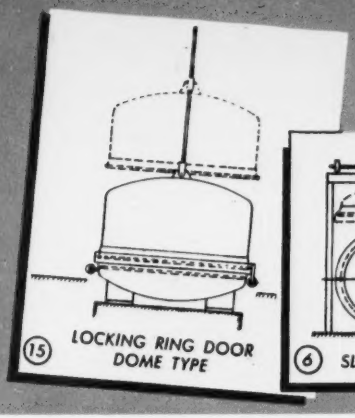

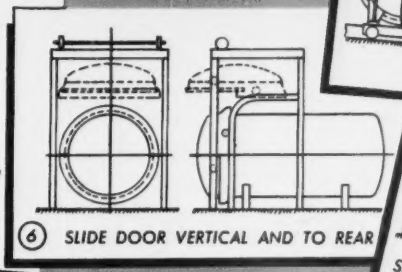

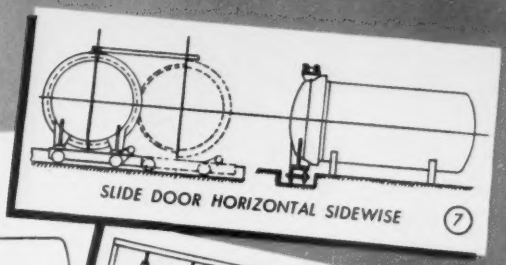

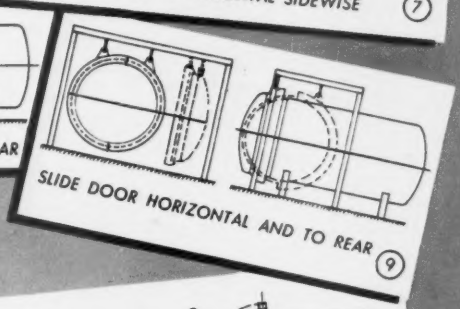

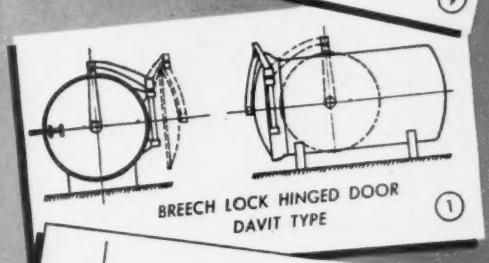

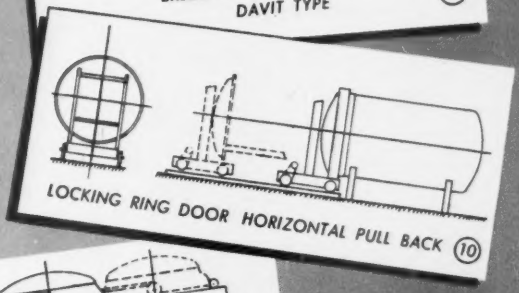

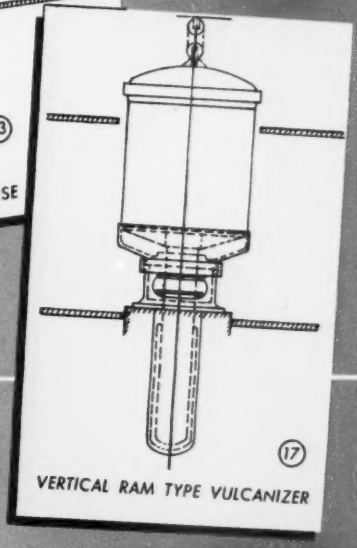

These designs illustrate the many methods employed for opening and closing doors. Several arragements are applicable to automatic cycle operation. Vulcanizers can be made for either horizontal or vertical operation and equipped with hydraulic rams for compressing molds inside. Many vessels are equipped with power-operated circulation fans mounted inside, driven by externally-mounted motors. Vulcanizers have been built to withstand full vacuum or internal pressures up to 1000 pounds per square inch. We have designs and patterns available for almost any diameter up to 15 feet, and for any length.

We will be glad to work with you in applying any of these units to your particular problem.

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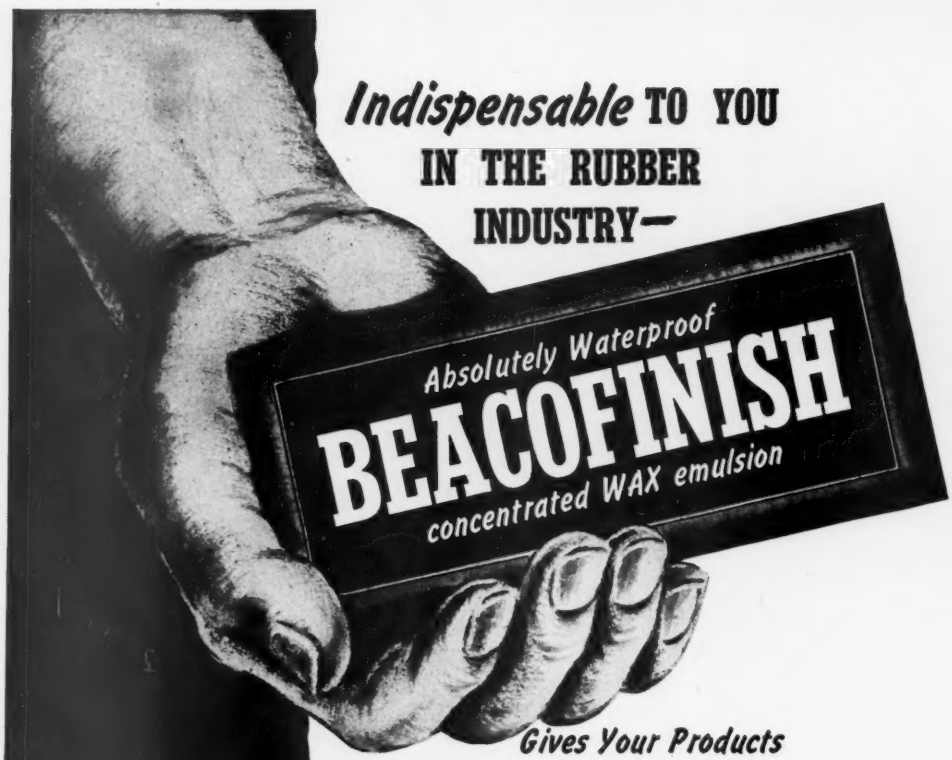

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Gives Your Products PROTECTION and SALES APPEAL *at Little Cost!*

BEACOFINISH—a unique family of coating materials conceived to give your products greater durability and eye appeal. These highly concentrated wax emulsions that can be diluted with up to four parts of water can be used with the utmost safety and economy.

BEACOFINISH is therefore of four-fold importance to you:—

1. ***It Protects*** your products against their natural enemies—air, sunlight, moisture and excessive handling.
2. ***It Improves*** the appearance of your product for its uniform coating stimulates greater consumer interest.
3. ***It's Economical*** because its high dilution potential (without losing efficiency) allows one gallon to cover 15,000 sq. ft.
4. ***It's Safe*** being a wax in water emulsion, it eliminates the fire and health hazards of volatile-solvent based finishes.

BEACOFINISH can be applied by dipping, sponging, spraying or brushing—dries in about 20 minutes—faster if force-dried—to give a hard protective coating of great elasticity.

BEACOFINISH may be ordered in Neutral or Black, in varying degrees of luster from brilliant to dull. It is so concentrated, from one drum you can obtain potentially up to five drums of superior coating for your products.

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Let us show you how BEACOFINISH can make your products more attractive and saleable—protect them from damage—you from loss—in production and transit!

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For Greater Profits Improve Your Products with AERO* BRAND STEARATES

Aluminum · Calcium Zinc · Magnesium

Because of their purity and uniformity, AERO Brand Stearates are helping many manufacturers increase the efficiency of their processes and improve the quality of their products.

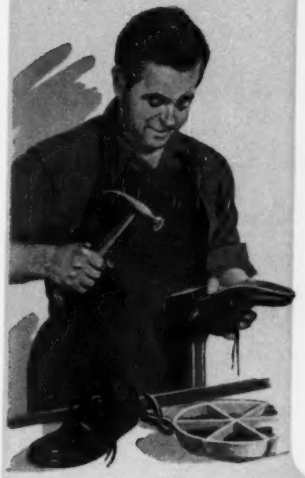
Why not give your processes and products the benefit of these quality stearates? They are produced by a new process utilizing modern equipment. Continuous chemical control is maintained from raw material to final packaging. For whatever purpose you need them – plastics, rubber, paint, or other applications – AERO Brand Stearates will meet your most exacting specifications.

A descriptive booklet outlining the qualities and applications of AERO Brand Stearates is yours on request. Write for a copy.

*Trademark

IN VINYL TUBING for garden hose, laboratory apparatus or other uses, **AERO Brand Calcium Stearate** acts both as an internal mold lubricant and as a stabilizer, absorbing and preventing HCL from giving off chlorine and darkening the vinyl on age or exposure to light.

NO MIXING by the retailer prior to sale, and very little "elbow grease" by the user are required when **AERO Brand Aluminum Stearate** is used in paints. This stearate assures continued suspension of pigment particles — permits long storage without caking or settling.



RUBBER HEELS and other rubber products such as sheeting may be produced with greater ease and speed through the use of **AERO Brand Zinc Stearate**. This stearate not only prevents sticking to molds but dissolves in the rubber on vulcanization, leaving a smooth, polished surface.

PURITY, assured by strict chemical control, makes **AERO Brand Zinc and Magnesium Stearates** excellent for cosmetic powders of every type—face, body, after shave, baby and all-purpose powders. All benefit by the improved "slip" and adhesiveness that these **AERO Brand stearates** provide.

AMERICAN Cyanamid COMPANY

INDUSTRIAL CHEMICALS DIVISION, DEPT. H11

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use—

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● **FINE particle size white pigment. Brightness 90-92. GOOD reinforcing. Excellent *processing*.**

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DC *SILICONE* MOLD RELEASE EMULSION NO. *35A*

CUTS MOLD MAINTENANCE 90%

CLEAN RELEASE FROM *CLEAN* MOLDS

gives you better quality moldings with uniformly fine detail, closer tolerances and a better surface finish, plus an all time low in reject rate. Add to these advantages the money saved in mold maintenance and the cost of molds in inventory and you have the key to higher production and more profit. That's why the major tire companies and the leading molder of floor tile, rubber heels and soles, and mechanical goods of all kinds use DC Mold Release Emulsion No. 35A.

***PLUS* GREATER STABILITY**

Comparative tests indicate that DC Mold Release Emulsion No. 35A is at least 10 times as stable as other silicone mold release emulsions in contact with the hardest kind of water.

DC Silicone Mold Release agents are exceedingly versatile materials for which a wide range of uses have been established in the rubber industry. For more information call any of our branch offices or write for data sheet AE11.

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What the Reviewers Say About the Book,

"RECLAIMED RUBBER"

The Story of an American Raw Material

by **JOHN M. BALL**

★★★★★★★★★★★★★★★★★★★★★★

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3. Marks and the Alkali Process
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7. Manufacture
8. Properties and Uses
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10. World War II

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Size: 6 x 9 in.
248 Pages
Illustrated

★★★★★★★★★★★★★★★★★★★★★★

"The book is handsomely produced, delightful to read, most informative—in short, a perfect model of what a technical book should be."

INDIA RUBBER JOURNAL

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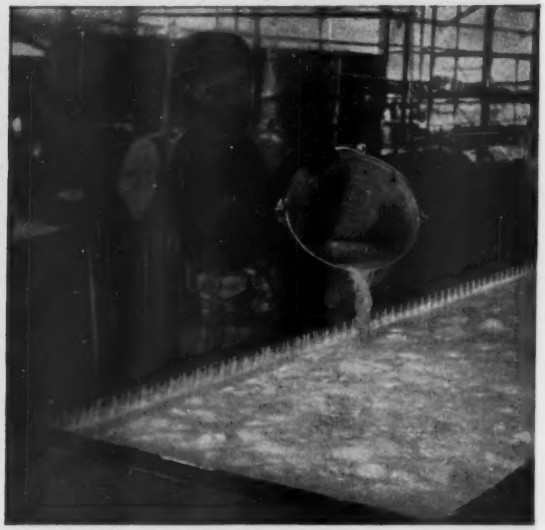

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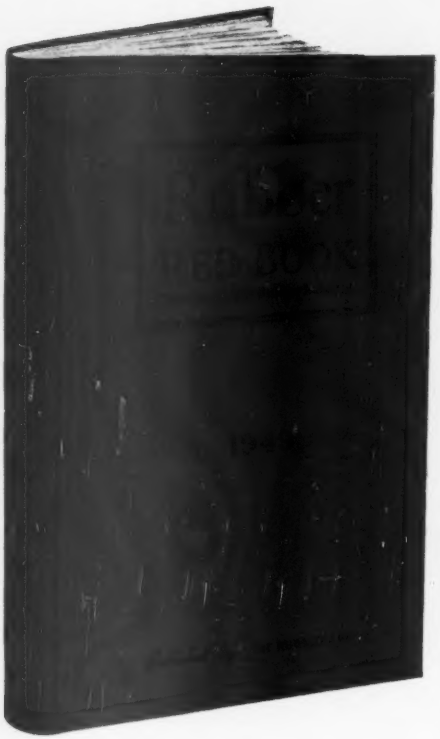

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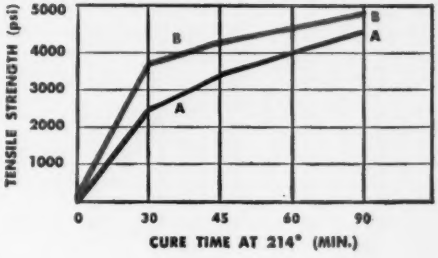

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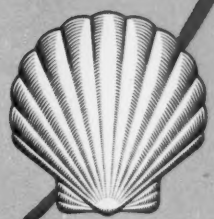

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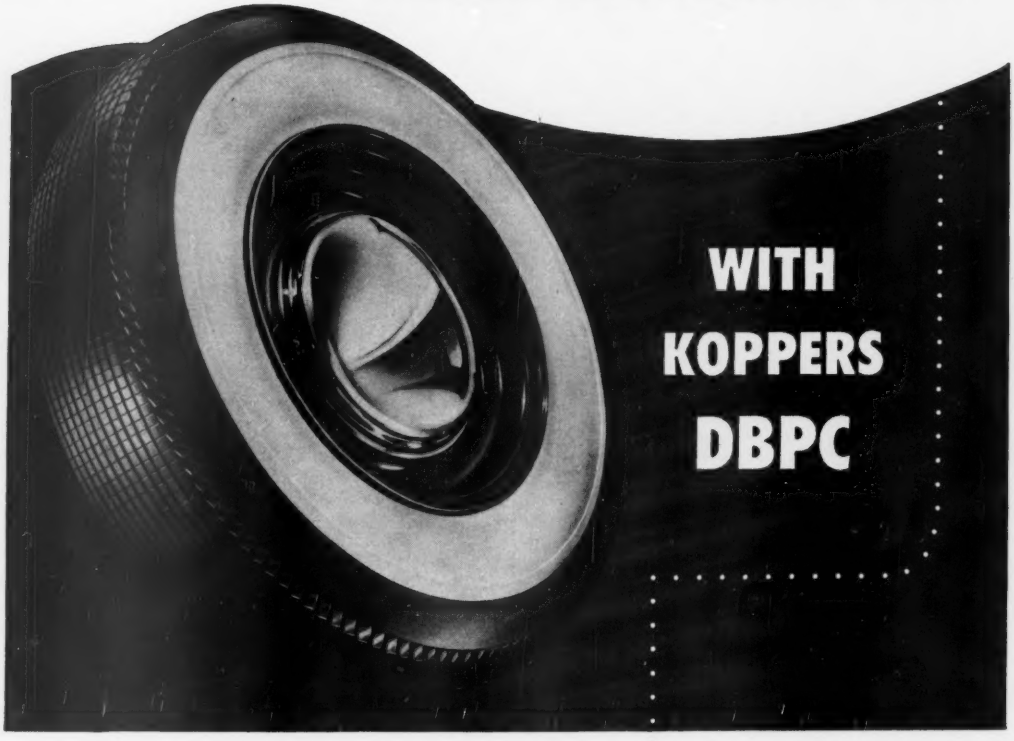

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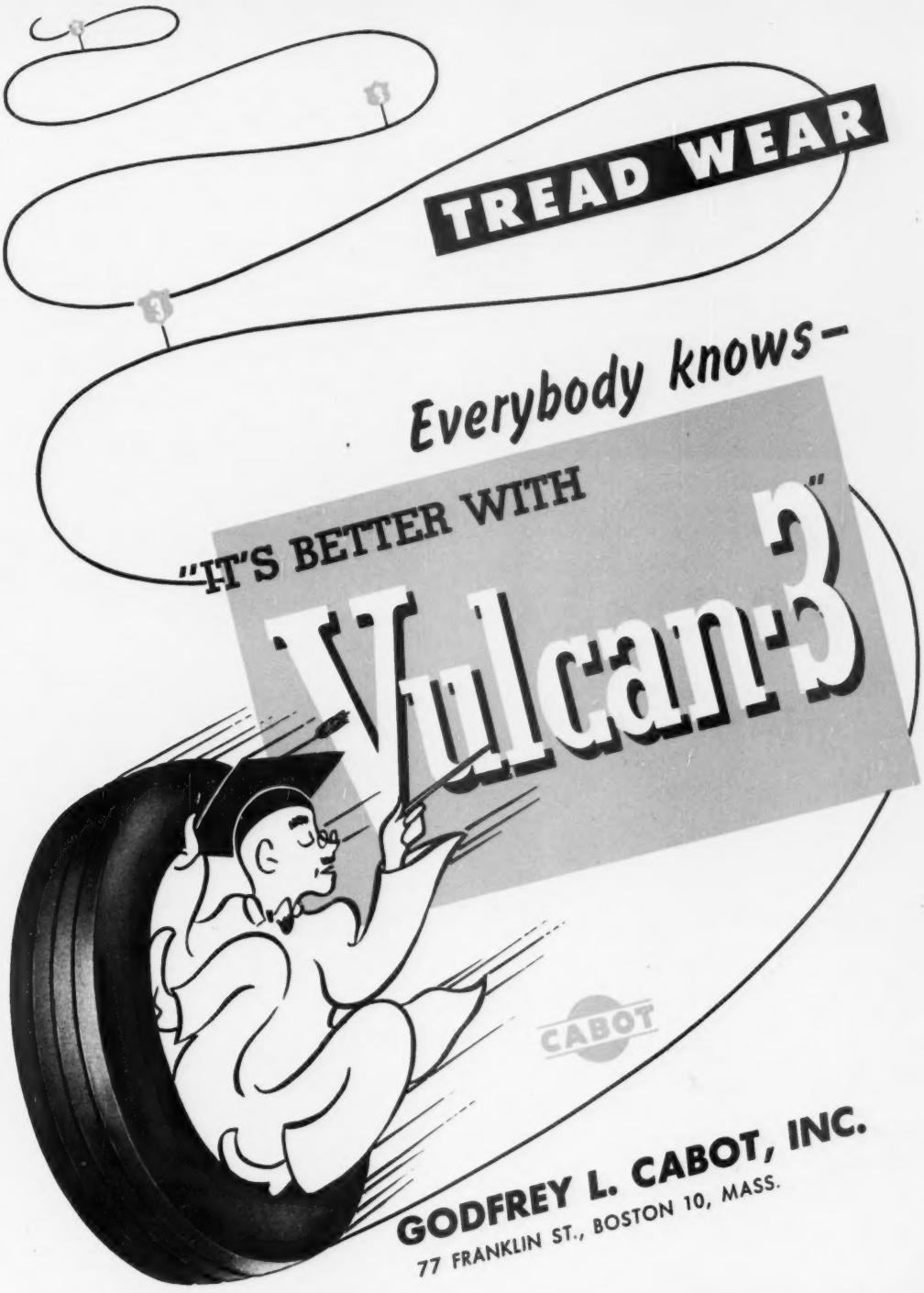
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RUBBER AGE

Vol. 66, No. 2 NOVEMBER, 1949

Application of Beta Ray Backscattering to Industrial Gauging

By J. R. CARLIN

Tracerlab, Inc., 130 High St., Boston 10, Mass.

ONE of the first truly industrial applications of pile-produced radioisotopes is the recently introduced thickness gauge employing the principle of absorption of radioactive radiation. Basically, the equipment consists of a radioactive source and a radiation detector between which the material being measured is located (Fig. 1). The degree of absorption or attenuation of the radiation by the unknown material serves as an exact and reproducible indication of the weight per unit area, or thickness of the sample, if its specific gravity is known. Instruments of this type which are presently available employ beta ray emitting isotopes.

Beta particles consist of highly energetic electrons originating in the nuclei of atoms undergoing radioactive decay. It is important to note that they are not mono-energetic, but possess instead a continuous spectrum of energies (Fig. 2) and, therefore, to describe the beta rays from a radioactive source, the maximum energy usually is stated, understanding that the average energy is appreciably less than this maximum.

The instrument described above can be employed whenever the sheets of material under investigation are accessible from two faces, and since it is a non-contacting type of gauge there is no danger of interfering with production or possibly causing material damage, frequently resulting in wasteful breaks.

With few exceptions non-contacting type gauges like the one described require that the material being measured be accessible from two faces. This necessary condition applies also to magnetic, capacitance, x-ray and photoelectric type gauges. For this reason a new type of instrument employing beta ray emitting isotopes has

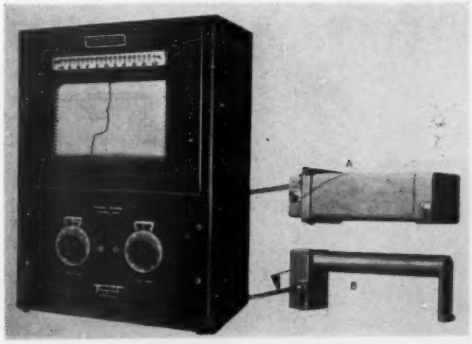

FIG. 1—An "absorption" type Beta Gauge showing the detector unit A and the source mount B, together with the indicating console.

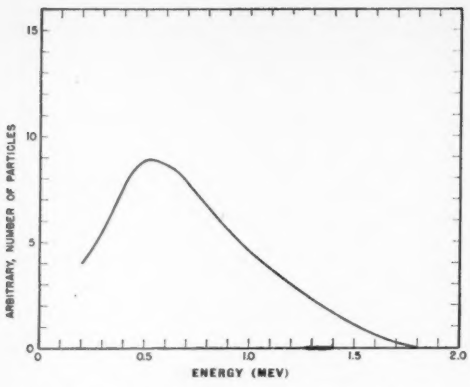

FIG. 2—Energy distribution of a typical single beta source.

been developed to make possible weight per unit area or thickness measurements on materials which are accessible from only one face or on materials superimposed on other substances, provided in this latter case that an atomic number difference exists between the two materials. The measurement is entirely non-destructive and no physical contact is made with the specimen, which can either be stationary or in motion.

For example, accurate measurements can be made on rubber or plastics compounds, or the total weight per area of rubber coated fabrics while setting on the surface of a calendering roll (Fig. 3). In addition, a wide variety of measurements outside the rubber and plastics industries can be achieved with extraordinary accuracy (± 0.01 mg/cm^2) as in the measurement of weight per area or thickness of tin or zinc coatings on steel, barium salts on photographic paper, paint on metallic surfaces, selenium on aluminum, etc. The instrument is basically a weight per area indicating gauge independent of variations in specific gravity. If, however, the specific gravity of the specimen is known, or is constant, then the gauge can indicate true physical thickness.

Magnetic type gauges have been used for some time in rubber and related industries to accomplish the gauging of sheets of material while on calendering rolls. These devices have been found to be excessively sensitive to variations in the magnetic properties of the calendering roll itself, which varies markedly with temperature. Other instruments, namely capacitor type gauges, are usually sensitive to the presence of moisture especially when one recognizes that the dielectric constant of water is 30 to 80 times greater than that of rubber.

This new type of gauge employs the principle of beta ray backscattering, and is not affected by any of the above considerations. Operationally, a source mount S containing a beta emitting radioisotope is located outside the window of a radiation detector D (Fig. 4). The window face is thinner in structure than the other sections of the detector to permit the entrance of beta particles from this one direction. Normally radiation from the radioisotope source mount is propagated outward and no response is observed in the detector unit.

If a layer of material A is now inserted into measuring position beneath the source and detector, some beta particles will be scattered or diffusely reflected by A and return to enter and energize the detector. As the weight per area or thickness of A is now increased, more and more beta particles which had previously penetrated beyond A suffer path deviations while in the reflecting medium and return to cause increases in detector response. This effect plotted as the curve in Fig. 5a reaches a final asymtotic saturation value when A becomes so thick that the most energetic beta particle can no longer penetrate to the furthermost edge of A and still possess sufficient energy if backscattered at that point to return through this same thickness to enter and actuate the detector. The value of weight per area (mg/cm^2) at which the saturation value of detector response is attained depends only upon the maximum beta particle energy emitted by the source. This thickness is termed the "infinite" thickness of the material for the particular beta emitting isotope. The value of detector response attained at this thickness is a function of the atomic number of the scatterer.

The scattering of beta particles is accomplished by two mechanisms: electrostatic interation between the beta particle and electrons present in the scattering medium and, in addition, nuclear scattering due to the generation of coulomb forces between the beta rays and the positively charged scattering nuclei. Fig. 6 depicts the variation of detector response versus atomic number of scatterers of infinite thickness using one particular isotope, Ru^{106}.

Returning to the curve shown in Fig. 5a, it is therefore possible to measure the weight per area or thick-

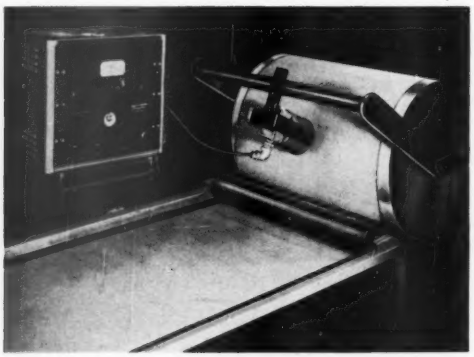

FIG. 3—A beta ray "backscattering" type gauge in operation.

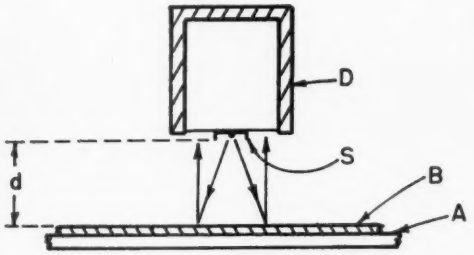

FIG. 4—Basic components of a backscattering gauge showing the detector (D), source (S) and scattering substances (A) and (B).

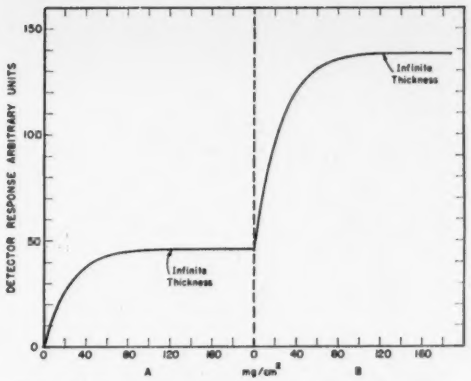

FIG. 5—Detector response versus weight per unit area of scattering material A in (a) and of scattering material B superimposed on A in (b).

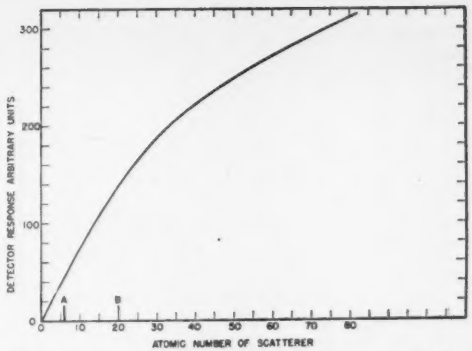

FIG. 6 —Detector response or scattering ability versus atomic number of scatterer.

ness of materials like A without physically contacting the specimen and by "examining" the specimen from only one direction. Choice of isotope depends primarily upon the range of weight per area to be covered by the gauge, remembering that the ideal source material is one that provides the steepest and most linear section of its scattering characteristic curve over the desired range.

The value in mg/cm² at which any radioisotope reaches its saturation value (infinite thickness) depends only upon the maximum beta particle energy emanating from the source. This value of weight per area is equal on the whole to one-half the value of weight per area of material required for complete absorption of the radiation when the absorbing material is interposed between the source and detector. This is almost intuitive if one considers that in the case of backscattering the beta particles must not only penetrate the entire thickness of the material at "infinite thickness" but also return through this same thickness to reach and actuate the detector.

Consider now a layer of material B superimposed on A and possessing an atomic number different from A. The response in the detector will now start to increase or decrease, depending if the change is to higher or lower, respectively, atomic number. In the case shown in Fig. 5b, the change is to higher atomic number and the response in the detector rises with increasing weight per area of material B until a new saturation value of detector current is reached. The saturation value of current depends only upon the atomic number of material B, since the same radioisotope is employed. The infinite thickness value of B, in terms of mg/cm², is the same as it was for A. The two curves in Fig. 5a and b differ only by a constant ordinate factor. Empirically the analytical function describing these curves was found to be

$$\frac{I}{I_{it}} = 1 - e^{-\mu w}$$

where I_{it} represents the response in the detector at "infinite thickness," μ, the coefficient of scattering and w the weight per area of the scatterer.

A very noteworthy fact is that the shape of the curves shown in Fig. 5 is independent of the geometry of the source-detector unit with respect to the scatterer. A single ordinate factor is introduced when the plane of the scatterer is changed from being perpendicular to the axis of the source-detector unit to an inclined position or even curved such as in the measurement of material flowing over a calendering roll. A simple sensitivity control is provided which can be adjusted to compensate for this factor introduced by changing geometry. Calibration information obtained with only one kind of material serving as scatterer can be applied to all other substances by simply adjusting this detector sensitivity control.

It is essential when measuring one material superimposed on another of different atomic number that the instrument be insensitive to variations in the thickness of the base substance. This means that the minimum thickness of the base material at least equals the "infinite thickness" for the beta rays employed. If this thickness is slightly less than "infinite thickness" errors are introduced which are frequently not disconcerting because of the small slope of the backscattering characteristic in the region of infinite thickness. In other words the gauge becomes grossly insensitive to variations in the thickness of the base material provided it is in the region of infinite thickness.

One very critical consideration as far as industrial

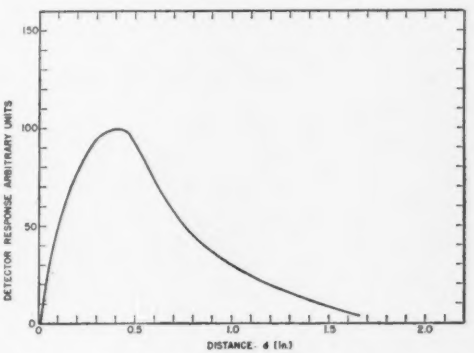

FIG. 7—Sensitivity of a backscattering gauge as a function of the distance from the source-detector unit to the surface of the scatterer.

instrumentation is concerned is the sensitivity of the gauge to variations in the distance d (Fig. 4) between the source-detector unit and the surface of the scatterer. If we consider d = 0 all the beta particles reflected from the material being measured would be absorbed by the source mount S while returning to the detector. As d is increased from zero by moving the source-detector unit away from the surface of the scatterer, more and more radiation enters the detector until d becomes so large that the solid angle subtended by the detector at the scattering surface becomes sufficiently small now to cause the response in the detector to decrease. Fig. 7 indicates the variations in detector response with changes in d for the gauge shown in Fig. 3. It is quite obvious therefore that a certain optimum value of d exists which makes the instrument insensitive to variations in d, in this case 0.40 in. This optimum value is independent of the nature of the material being measured and almost independent of the radioisotope. It is a function primarily of source-detector and scatterer geometry.

It is important now to describe the type of detector employed, although only secondary modifications in the results described would appear should the nature of the detector be altered. Geiger counter tubes and ionization chambers are at present the only radiation sensitive devices that appear to be suitably reliable for commercial application. The stability of Geiger tubes, however, is frequently questionable, and they are limited by their inherently short lives, which can be extended somewhat by decreasing the intensity of the radiation to which they are exposed. Doing this, however, exaggerates the statistical inaccuracies introduced by the random nature of radioactive transformations. These inaccuracies appear as random fluctuations in detector response, which can be smoothed away by an integrating circuit. The time constant, however, introduced by a suitable integrating arrangement is usually excessive and frequently undesirable. Consequently ionization chambers, subject to none of these limitations when higher levels of radiation are employed, were chosen as the radiation sensitive elements.

An ion chamber is simply a cavity containing some ionizable medium, in this case air at atmospheric pressure. Contained within the medium are two electrodes across which a voltage is applied. Upon irradiation, the ions developed by several processes to be considered later are caused to drift to the collecting electrodes, thereby establishing a small current which can be measured directly by an electrometer or amplified to operate a current meter or recorder. Without the presence of a collecting voltage the ions, positive and negative, would move about at random until they would recombine to form stable neutral atoms again.

As the intensity of the electric field is increased recombination is discouraged and more and more ions collected, until finally sufficient voltage is applied to draw the charged particles out of the field immediately upon formation. Recombination is effectively reduced to zero at this point and the ionization current reaches a saturation value which remains constant and independent of additional increments in voltage over a wide range. It is in this characteristic saturated region that an ionization chamber is normally operated. The magnitude of the saturation ionization current here depends only upon the incident radiation intensity.

The ionization chamber is followed by a suitable electrometer amplifier which provides sufficient circuit flexibility so that the indicating meter or recorder can be calibrated on a plus or minus percentage from a certain preselected value of thickness basis or possess a definite scale range which is never altered.

The source material is firmly sealed within its container to prevent any danger of contamination, and the intensity of radiation in the vicinity of the gauge is maintained far below tolerance limits.

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Additional Reports of Avoidable Accidents

CONTINUING its campaign to reduce accidents in rubber manufacturing plants by pointing out some avoidable accidents, the Rubber Section of the National Safety Council used the following illustrations in a recent issue of its Rubber Safety News Letter:

Elevator: While a man was stacking bales of rubber in a warehouse, the hoisting cable on the portable elevator broke, permitting the platform to fall. The safety device on the platform failed to operate so that the platform fell to the floor. The operator was caught in such a manner that his right wrist was sprained and his right leg severely bruised.

A more vigorous inspection and maintenance program could have prevented this injury. It is likely that regular inspection of the wire rope would have revealed that it was becoming defective before it actually failed. Even if the incipient failure of the cable had not been caught, regular inspection and maintenance of the safety device should have had it in condition to arrest the fall soon after it started.

Failure of Wheeled Jack: While a skid was being lifted with a wheeled jack, the jack handle failed to catch on the ratchet. The handle flew up and caught the operator's hand between the skid box and the jack handle. The injury was, fortunately, not very severe. The investigation revealed that the man had known that the jack was not operating quite as well as it should but had neglected to report the fact to his supervisor. There was no arrangement for periodic inspection.

Improper Mill Operation: While a tough stock was being warmed up on the mill, it broke from the roll and fell into the pan. The operator picked it up and put it back on the roll. When he did, it fell back to the pan instead of following the roll. The sudden application of weight bent his hand back and broke his wrist.

It is common for tough stocks to break and fall into the pan while they are being warmed up. Every experienced mill man is accustomed to having this happen and to having to place the rubber back on the mill roll. The only difficulty in this case was that the man was handling the rubber while preoccupied. This broken wrist will remind him of the error of this practice for a long time and he will probably be a missionary to his fellows, but the only real answer to this type of injury is still the tedious one of education.

On the Inadequacy of Laboratory Evaluation of Natural and Synthetic Rubbers

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TO detail the work that has been done on test methods and on specifications for compounding ingredients would entail the study of individual specifications by a host of suppliers and consumers. In many cases this would result in a reference to the customer's standard sample. Excellent work has been done on raw rubber, both natural and synthetic. Great impetus was given this type of evaluating through the necessity of manufacturing, controlling and improving synthetic rubber. A new vocabulary has been developed, contributing to and borrowing from the technology of plastics and fibers with which rubber technology has been welded into the science of high polymers.

On the other side of the picture, there has been a great amount of work and ingenuity expended on standardizing test conditions as, for example, the work of the Testing Committee of the Rubber Division *(25)* which specified temperature and humidity conditions for tensile testing and the many standardized procedures of the A.S.T.M. for sampling and sample preparation.

Many static and dynamic tests have been devised for the laboratory evaluation of vulcanized rubber goods or sample specimens. We have artificial aging tests, the better known of which are the Bierer-Davis oxygen bomb *(2)*, the Geer oven *(15)* and its modifications with the introduction of synthetic rubber, and the various exposure tests for sun cracking, including the combination of flexing and exposure *(14)*. Typical of the scope of this work, Newton *(24)*, in 1947, published a bibliography of 41 references on flex cracking.

In the field of abrasion testing, the more popular machines include the DuPont *(36)*, the Goodyear Angle *(33)*, New Jersey Zinc *(9)*, Bureau of Standards *(30)*, U. S. Rubber *(3)* and the Lambourn *(20)*.

For the evaluation of the dynamic or resilient properties of rubber, there is the simple rebound test as exemplified by the Luepke Pendulum *(22)*, the Healey Pendulum *(19)* and its modifications by Goodyear *(13)*, the Bashore Resiliometer *(1)* and the Schopper *(28)* rebound tester.

Other forms of hysteresis machines include the Yerzley Oscillograph *(38)*, in which the logarithmic decrement of the vibration of a rubber specimen under load is used to measure resilience, the Goodrich Flexometer *(21)*, the Firestone Flexometer *(8)*, the St. Joe Flexometer *(18)*, and the Schopper detrition machine *(23)*, in which either temperature generated or time to failure due to excessive heat generation are used as measures of hysteresis. The high frequency dynamic properties of rubber compounds are evaluated by impressed or resonance vibration as described by Sebrell and Dinsmore *(29)*, and by Dillon, Prettyman and Hall *(11)*, to mention but a few.

Note: This paper was presented by Mr. Braendle before the Rubber Chemistry Division of the Chemical Institute of Canada at Hamilton, Ontario, Canada, on June 10, 1949.

Even this cursory review of laboratory testing shows that much thought and ingenuity have been expended on the invention of new testing equipment which will simulate various phases of use and give a quick forecast of what a finished article may be expected to do in actual service. In spite of all these laboratory tests, the rubber compounder usually is very critical of laboratory evaluation and is reluctant to change a compound or process that has been "running well" and has a good service record.

Standardized Mixing

Much has been done about improving the precision of control of what goes into the making of a rubber article, and in the devising of better tests to forecast the probable service of the finished article. By comparison too little attention has been paid to the intermediate stage, viz., the putting together of the ingredients for making a rubber article.

The industry still uses roll mills and dough mixers. They have become bigger and better and more efficient, at least as regards output in pounds per minute or per dollar. This has been particularly true during and after the war when the demand, first for military goods and later for the replenishment of civilian needs, kept production at an unprecedented level. In consequence there has developed an ever widening divergence in the conditions under which the factory puts its compounding ingredients together and the way it is *specified* that the laboratory shall put its test batch together.

That this has happened is in large measure due to the relatively little attention paid by the average laboratory technician to this phase of his work. The job of mixing is often dirty and is delegated to the new man or least skilled in the organization. This attitude is not new.

Early Specifications on Laboratory Mixing

In 1914 Caspari *(7)* in "a manual based on personal experience" described tests for crude rubber, compounding ingredients and manufactured rubber, illustrating machinery and apparatus required. However, he made no reference to procedures for laboratory mixing.

In 1915 the Bureau of Standards *(5)* discussed compounding very sketchily and dismissed the question of mixing temperatures with the following: "The temperature of the rolls is so regulated that as the operation of mixing proceeds the compound sticks to one of them in the form of a sheet."

In 1920 Whitby *(37)* covered the testing of raw and vulcanized rubber exhaustively, but, on the subject of mixing, states: "Undoubtedly a certain amount of experience is necessary in order to perform satisfactory and consistent mixing, but the scientific worker, or, in

TABLE I—EFFECT OF MIXING TEMPERATURE ON A GR-S-EPC TREAD

(Laboratory Mill Mixed)

	Cool Mix	Warm Mix
Mill Temperature at Start	80° F.	210° F.
Stock Temperature (Final)	130° F.	250° F.
Modulus (L-300)	840	1150
Tensile	2880	2940
% Elongation	635	575
Shore Hardness	54	57

fact, any person of ordinary intelligence, can secure such experience in a comparatively brief time . . ."

At the April, 1924, Meeting of the American Chemical Society, the Report of the Physical Testing Committee of the Division of Rubber Chemistry *(32)* in discussing milling recommended: "(1)—Mill at as high a temperature for as short a time as consistent with thorough mixing and good dispersion of pigment. (2)—Endeavor to standardize both time and temperature of milling, with regard to the composition of the stock. In general, stocks high in rubber content should be milled at temperatures from 80° to 100°C., and the time need rarely exceed 20 minutes. Highly compounded stocks generally require somewhat lower temperatures but rarely lower than 60°C."

The Physical Testing Committee, as set up in 1926, in its concluding report *(31)* on standardization of physical testing of rubber stated:

"Mill Data.—The rolls of the laboratory mill shall be 12" in width x 6" outside diameter and the working distance between the guides shall be 10½ inches. The speed of the slow roll shall be 24 R.P.M. and the gear ratio should be 1.4 or as near that figure as is compatible with engineering practice. (Variation of 2 R.P.M. may cause 3% variation in tensile).

"Mill Temperature.—No satisfactory method of controlling the temperature of the batch during mixing has been devised. However, it is recommended that the temperature of the water entering the mills be maintained at 158°F. (70°C.).

"It is certain that with sufficient water passing through the rolls and a uniform initial temperature of 158°F. (70°C.), the process of mixing can be made much more uniform. It is recommended that the initial temperature of the rolls be 158°F. (70°C.) which can be attained by the flow of 158°F. (70°C.) water."

The American Society for Testing Materials, although founded in 1898, did not concern itself with rubber goods until about 1912. In 1915 the first specifications on rubber goods were set up. It was not, however, until 1935 that any specifications on the mixing of laboratory batches of rubber were introduced. These followed substantially the recommendations of the Physical Testing Committee of the Division of Rubber Chemistry and, like those recommendations, specified a roll temperature of 158°F. (70° C.).

Mixing of Natural Rubber

In 1924, following the pronouncement of the Physical Testing Committee, Division of Rubber Chemistry (see reference above), to "mill at as high a temperature for as short a time as consistent with thorough mixing and good dispersion of pigment," many authors investigated the effect of mixing temperature. In the presence of zinc oxide, Depew *(10)* used temperatures of 60 and 100°C. and times of 15 mins. and 60 mins., and concluded that: ". . . time of milling affects the solubility, as compared with consistency, to a relatively greater degree than temperature of milling."

The effect of mastication of natural rubber has been the subject of many studies, including the following. In 1930 Grenquist *(16)* discussed the effect of time, temperature and atmosphere of milling and concluded as follows: "In this investigation no agency has been found which causes such far-reaching and profound destruction of the elastic properties of the rubber as prolonged physical mastication."

In 1931 Wiegand *(34)* evaluated the effect of overmilling on compounded rubber and concluded: "(1) Whenever, in order to obtain pigment dispersion there is need for prolonged mastication or mixing, this should be carried out at a relatively low temperature and without organic accelerator. (2) Such mixing should be reduced to the shortest possible time as it causes injury both to immediate properties and to ageing properties."

In 1936 Faberov and Margolina *(12)* in discussing thermal plasticizing of rubber concluded: "(2) The basic factor in thermal treatment (under corresponding temperature conditions) is oxygen, there being a certain quantitative dependence between the amount of plasticizing and the concentration of oxygen . . . In a medium free of oxygen (in carbon dioxide, nitrogen and ammonia) the process of thermoplasticizing is exceedingly low."

TABLE II—FACTORY AND LABORATORY MIXED COLD RUBBER TREADS

Factory			Laboratory		
Equipment	Time	Stock Temp.	Equipment	Time	Stock Temp.
No. 11 Banbury 20 RPM	6' M.B.	270° F.	6" x 12" mill	16'	240° F.
No. 11 Banbury 40 RPM	4' Remill	375° F.	(200° F. water)		
No. 11 Banbury 20 RPM	4' Finish	260° F.	Resheet	4'	240° F.
Warm-up Mill	6'	230° F.			
Feed Mill	3'	230° F.			
Tuber	.5'	270° F.			
Total Time	23.5'			20'	
Cure	60'/292° F.			60'/292° F.	
L-300	1630			1320	
Tensile	3750			3870	
Elongation	545			645	
Rebound	59			56	

Busse and Cunningham *(4)* studied mastication and concluded: "The rate of breakdown of smoked sheet, pale crepe and sprayed-latex rubber in a laboratory internal mixer is a minimum at temperatures around 240°F., and the rate may be increased as much as four or five-fold by either raising or lowering the temperature 80°F."

Thus it was well established that either prolonged or severe milling or hot processing was detrimental to natural polymers because of the progressive degradation due to oxidative breakdown or scission.

Laboratory Mixing of Synthetic Rubber Test Batches

The adoption of laboratory testing techniques as used for natural rubber to the evaluation of butadiene-styrene copolymers left much to be desired. Thus in 1942 Carlton and Reinbold *(6)* stated: "All mixing and remilling should be done at as low a temperature as possible. If mixing temperatures rise above 200°F., physical properties of the compound are depreciated."

During the war, committees under O.R.D. set up a specification for mixing of GR-S test compounds of the tread type with laboratory mill rolls at 100°F. to 120°F. A minority recommendation at that time called for mixing in a Banbury to temperatures of 285°F. to 300°F. in order to duplicate factory mixing and to insure sulfur dispersion and solution.

In 1944 Wiegand and Braendle *(35)* showed that: "*(7)* Hot milling of GR-S shortens and reduces heat and flex properties . . GR-S shortened by heat cannot be restored by subsequent cold refining."

Still concerned with the effect of mixing temperature Schade and Roth *(27)* stated: "It has also been noted that the properties of a compounded stock and of the resulting vulcanizate depend on the temperature of the batch during the mixing process. Consequently, specification limits have been set for the temperatures of the mill rolls during mixing."

Piper and Scott *(26)* in discussing plasticization of natural and synthetic rubbers stated: "The tendency towards cross linking is a major defect of the butadiene-styrene co-polymers, as it leads to considerable stiffening and loss of extensibility ('heat embrittlement') when the vulcanizates are subjected to high temperatures. The present results emphasize the bad effect of allowing GR-S to become excessively hot when worked in an internal mixer, and particularly of allowing it to remain very hot after removal."

On January 1, 1946, the Office of Rubber Reserve issued "Specifications for Government Synthetic Rubbers." On page 28 it is specified that mixing GR-S test batches shall be on a 6" x 12" mill with roll temperatures maintained "between 110 and 130°F. throughout the mixing procedure." This has been carried through into the 1949 revised edition.

The mixing temperatures and procedures outlined above have remained standard and are probably used very widely throughout the industry even though little, if any, synthetic rubber tread stock is ever processed on factory scale without reaching temperatures of 300°F. to 400°F. Despite the fact that hot mixing shortens GR-S tread stocks and aggravates cut growth, good wearing and good flexing, treads have been and are being made from stocks which reach these high temperatures. From this point of view alone, if for no other reason, the limitation of laboratory mill roll temperatures to a maximum of 130°F. would seem improper.

TABLE III—EFFECT OF POLYMER GEL ON PROPERTIES OF 50 PHR EPC CARBON-GR-S COMPOUND (1944 DATA)

	Control	Bell Telephone GR-S		
Gel Content	?	5%	43%	70%
Processing	Good	Fair	Passable	Passable
Physical Properties				
Best Cure at 293° F.	40'	40'	40'	30'
L-300	900	900	1100	1425
Tensile	2525	2525	2625	2900
% Elongation	590	580	550	515
% Set	22	26	23	20
Shore Hardness	51	51	54	60
Log R (Min.)	8.7	8.9	8.9	9.5
Hand Tear	Fair	Fair	Passable	Passable

TABLE IV—LAMBOURN ABRASION RATINGS ON MILL MIXED TREADS

(Maximum Stock Temperature = 140° F.)

Polymer	Carbon A as % of Carbon B
Standard GR-S	113%
GR-S-10	103%
LTP Experimental No. J-12	107%
LTP Experimental No. J-3	106%
Average	107%

Hot Mixing of GR-S Treads

In an attempt to reduce this inconsistency, Columbian Laboratories have been moving toward higher mixing temperatures. Thus, using the 6" x 12" roll mill with 200 to 210°F. water circulating on GR-S-channel black stocks, it was found that, contrary to some early experience, there was an improvement in tensile and modulus through higher mixing temperatures, as shown in Table I.

Since, in the case of natural rubber, higher mixing temperatures resulted in a degradation or breakdown of the rubber, yielding softer and weaker compounds, it was apparent that the reversal in trend shown above with temperature of mixing called for some explanation other than oxidative breakdown of the polymer.

Continuing the study of mixing temperatures with cold rubber, a comparison was made of a hot factory mixed tread with a warm (200°F.) two-roll laboratory mill mix, as shown in Table II. This continued trend toward stiffer and harder synthetic treads as mixing temperatures increased demanded systematic review and study as to the basic causes.

Polymer Gel and the Carbon Gel Complex

In 1944 these laboratories were supplied with a series of polymers produced with increasing amounts of gel. Compounded with 50 phr of EPC carbon on an 80°F. two-roll laboratory mill, they showed an increase in modulus with increasing gel content, as seen in Table III. The conclusion that high mixing temperature, as applied to GR-S tread stocks in a factory, generates gel and hence increases stiffness and modulus was almost inescapable.

Sweitzer, Goodrich and Burgess *(31-A)* have demonstrated the formation of a carbon gel complex in the mixing and processing of cold rubber treads. Figure 1

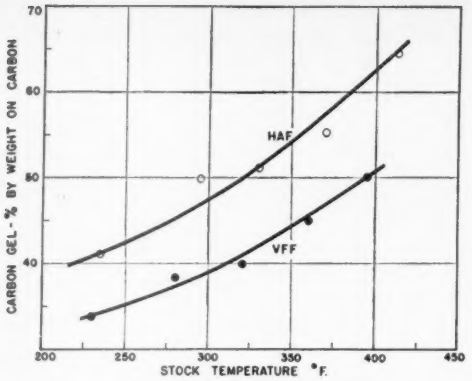

FIG. 1—Carbon gel vs. stock temperature for 50 phr carbon masterbatch in GR-S X-485.

taken from their work illustrates the effect of temperature on the formation of gel in the carbon gel complex. On this basis the increase in Mooney viscosity with mixing temperature shown in Figure 2 is also a logical consequence. Figure 3 also taken from Sweitzer's paper shows that gel induced by hot mixing raises modulus as does gel formed in the original polymer (see Table III).

Figures 1 to 3 illustrate the difference in level of gel-forming activity of the two carbons compared. That this occurs despite substantial equality in fineness and structure of the two carbons is discussed by Sweitzer et al, who point out the advantages and hazards involved in high gel formation, viz., improved wear at the risk of scorch in processing and flex failure due to shortness.

Quality Reversals With Change in Mixing Temperature

From the above it is apparent that carbon-gel formation is a function of both temperature of mixing and the kind of carbon employed. When these two variables were combined it was found that on the score of one very important property, viz., abrasion resistance, there was a reversal in rating as between cold (or specification) mill mixing and hot laboratory Banbury mixing in simulation of factory processing. Thus in Table IV are given the ratings on cold mixed stocks. When, however, the two carbons were the single variable in a hot (380°F.) laboratory Banbury mixed study on GR-S treads, the ratings were reversed.

Dr. T. R. Griffith of the National Research Council, in a private communication, reported that on hot Banbury mixing of carbons A and B in LTP, as compared with cold two-roll mixing, the abrasion resistance of carbon A increased 21% while that of carbon B fell off 3%. These abrasion values were obtained using the extraction technique of Griffith *(17)* et al. An Ohio rubber company ran the same two carbons in the factory at 300°F. and at 350°F. Carbon A improved 13% in road wear as the result of the higher mixing temperature while carbon B improved only 2.5%.

It is thus apparent that for any reasonable forecast as to the probable wear performance of a GR-S type synthetic tread, laboratory mixing should be done at close to factory processing temperatures.

The polymer chemist must share with the tire compounder his concern over temperature effects on gel formation and its effects on processing and tire life. Gel formation as a function of temperature is shown in Figure 4. Two 122°F. polymers and three 41°F. polymers were gelled by static heating in an air oven. The striking divergence in rate of gel formation with heat alone in the range of 300°F. to 375°F., i.e., in the range of factory processing temperatures, is highly significant and suggestive to both polymer chemist and compounder, i.e., degree and rate of carbon gel formation in mixing are also dependent on the polymer used.

Conclusions

(1) It has been pointed out that too little attention has been paid to mixing as a vital step in laboratory testing of rubber.

(2) Wih natural rubber, mixing procedure has, in general, been designed to give good dispersion of com-

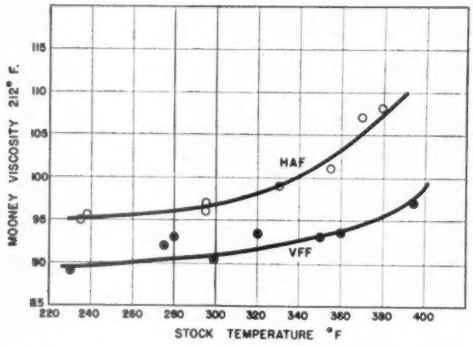

FIG. 2—Mooney viscosity vs. stock temperature for 50 phr carbon masterbatch in GR-S X-485.

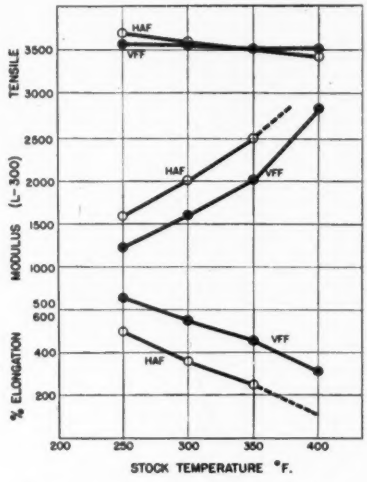

FIG. 3—Stress properties vs. mixing temperature of VFF and HAF in GR-S X-481 (40' at 292° F.).

pounding ingredients with minimal oxidative and mechanical breakdown of the rubber itself.

(3) With GR-S type synthetics, mastication of the polymer at high temperature (300°F. to 400°F.) introduces a new effect—gel formation.

(4) The carbon gel complex plays an important role in the processing and reinforcement of the rubber. The degree of its development has been shown to be dependent on temperature of mixing, type of carbon and type of polymer.

(5) Neither carbons nor polymers respond the same to temperature in their gel-forming activity.

(6) Laboratory mill mixing with stock temperatures well below 250°F. cannot predict final product quality when factory mixes of the same formulation regularly reach temperatures of 300°F. to 400°F.

(7) In the evaluation of experimental polymers, cold laboratory mill mixing seems incapable of assessing their potentials since such procedure avoids gel formation now seen to be characteristic of factory processed GR-S, whether of the 122° or 41° type.

(8) It therefore seems in order to consider a revision of laboratory mixing techniques from their present 20-year-old standard to bring them into conformity with the progress that has been made in factory processing and to fit them to the synthetic polymers.

ACKNOWLEDGMENT

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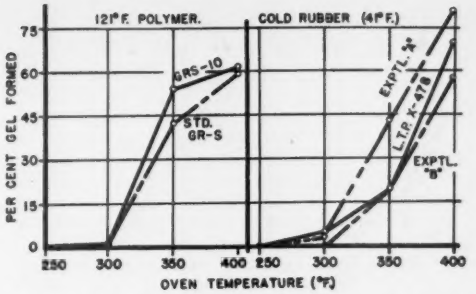

FIG. 4—Gel formed by static heat (one hour in air oven).

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Air-Operated Control Instruments

A new line of air-operated control instruments, known as the Series 500 Controllers, has been announced by the Bristol Company, Waterbury, Conn. Included are controllers for automatically controlling temperature, pressure, flow, liquid level, humidity, and pH value. The new controllers have calibrated control actions. Reset rate, derivative time, and proportional band adjustments are accurately calibrated and reproducible. They have only one service adjustment. Controllers can be completely disassembled and after being reassembled, with replacement parts, only one adjustment is required to put the system in exact calibration. All Series 500 Reset Controllers are equipped with reset action stops. The new instruments are offered in five types of control action: on-off, proportional, reset, derivative, and reset plus derivative. The instruments are readily convertible from one type to another.

The problem of low-cost, thorough and safe mixing and agitating of liquids, powders and various compounds in from 1 gallon round cans up to 55 gallon drums is said to be solved with the recent introduction of a new compact, portable, **motorized drum cradle truck** by the Morse Manufacturing Co., Inc., Syracuse, N. Y. Called the Rotator, a ½ h.p. enclosed type motor is mounted in balanced position under the truck frame and is an integral part of the unit. Full drum loads up to 500 pounds can be safely rotated at speeds of 40, 20 or 10 rpm.

Scott Brittle Point Tester

THE performance of a brittle point test upon vulcanized rubber and other elastomers, in conformity with ASTM Designation D746, is the function of the Model E Brittle Point Tester, manufactured by Scott Testers, Inc., Providence, R. I. The instrument is a development of the technical and mechanical staffs of the Research Laboratory of the American Cyanamid Co. It operates on a solenoid actuated guillotine principle with the prescribed standard test piece, and is so light in weight as to be readily portable.

The cabinet is a single piece of formed stainless steel with a durable plastic panel. The top is fitted with two glass covers with profiled stainless steel ends which completely enclose the testing chamber. The bottom of the cabinet is a water-tight pan with suitable drainage connection so that any condensation which forms on the testing chamber may be drained off at the completion of the test.

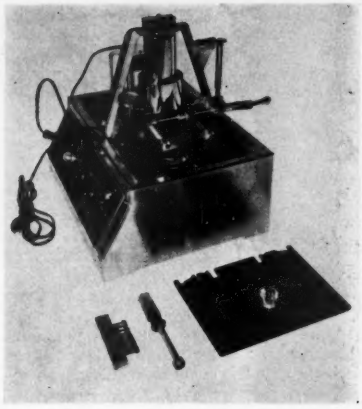
The stainless steel testing chamber, an integral part of the cabinet, has a capacity of 7½ quarts and is fitted with two mounting pieces to hold the testing equipment. Additional drain and stop cock are provided to drain the conditioning liquid from the test chamber when the instrument is not in use. The temperature of the conditioning medium within the test chamber, while manually controlled, is indicated on a specially graduated thermometer having a range of from −80° to +50° C.

The controls of the entire apparatus are on a single panel. Component parts of the panel are: an electrical outlet for the solenoid; a shielded ruby light to indicate if the heater within the testing chamber is operating; a switch for controlling the heater; a switch for operating the stirrer; and a solenoid firing switch for actuating the solenoid to operate the guillotine.

Electrical equipment consists of three parts each with its own control: (1) Permanently fastened to the bottom of the testing chamber is a 300 watt capacity heater operated by a switch on the control panel; (2) An electrically operated stirring motor, the purpose of which is to circulate the crushed dry ice in the test chamber in order to lower the temperature, with its own control mounted on the panel; (3) A specially constructed and designed solenoid incorporating Swedish iron to reduce residual magnetism and wound with wire insulated to protect it from elevated temperature. The entire solenoid is encased and shielded to protect it and the operator from damage.

The Brittle Point Tester is electrically equipped to operate on 110 volt, 60 cycle, single phase current; other current requirements can be met on special application. All switches, wire, and other electrical components are in accordance with standard specifications for such installations.

The sample clamp, which is the standard size sample, swings downward into testing position and upward into position for inserting the specimen by means of a single handle outside the testing chamber. This clamp is opened and closed by two clamp screws, a suitable wrench with insulated wire handle being provided for this purpose. Also provided is a special pre-loading magazine which holds 9 specimens similar to the standard T-50 sample with one broad end removed. This sample shape can be more readily obtained from molded specimens and permits the testing of more samples at one time, with the convenience of inserting the pre-loaded magazine as a unit in the clamp. Results with this type sample are readily comparable with standard samples. The clamp, when loaded, is lowered into the test chamber and held firmly in position. The guillotine is made in conformance with specifications governing this type of equipment and is held in positive alignment by two polished stainless steel rods with bearings in the base casting of the solenoid holder.



In the general design of this equipment the possibility of using the brittle point tester in other than in its standard form has been considered. By removing four screws and disconnecting the electrical supply for the solenoid, the entire guillotine, solenoid, and sample clamp may be removed from the chamber for use in a conditioned cabinet. The equipment can also be supplied with a testing chamber of the same dimensions as the standard one, but suitable for insertion into a standard Scott Model M T-50 cabinet using its controls, allowing the one Model M cabinet to be used for both purposes without the disconnection of existing facilities.

Component parts used in the construction of this tester are such that they should be safe from deteriorative action by such liquids as would be used in low temperature testing. In operation, the machine is quiet. It further has the advantage of extreme lightness for easy portability, weighing only 27 pounds. The tester is 13 inches wide, 16 inches long and 15½ inches high, permitting it to be stored readily.

Fisher Scientific Co., Pittsburgh 19, Penna., recently introduced a **refrigerated bath** for laboratory use which obviates the need for makeshift arrangements and the use of ice in cooling reaction vessels with their contents. It is a copper-lined steel cabinet with a tray adjustable by means of supporting chains over a height of 10 inches. A sensitive thermostat and control provide low temperatures which can be maintained for 15 to 50 gallons of water at any point from 0° C. to room temperature.

A new line of **double piloted single plunger valves** has been introduced by C. B. Hunt & Son, Inc., Salem, Ohio. The valves consist of an aluminum housing, a hollow stainless steel plunger with precision placed ports, and stainless steel pilot pistons mounted in brass pilot cylinders. The pilot cylinder can be operated at pressures as low as 25 psi, permitting the use of the valves at most instrument air pressures, and making them extremely well suited for use in safety control arrangements on presses, shears, cutters, etc.

Additional Developments in the Field of Testing Procedures for the Evaluation of Natural and Synthetic Rubbers and Plastic Elastomers

Sponsored by Bureau of Ships, Navy Department

By THEODORE A. WERKENTHIN

Principal Materials Engineer, Bureau of Ships, Navy Department, Washington, D. C.

Part II

THERMAL TESTS AT LOW TEMPERATURES

Low Temperature Flexibility Test for Hose of Small Diameter: Personnel of the Material Laboratory at the New York Naval Shipyard have recently developed an improved apparatus and method for evaluating the low temperature flexibility of small diameter hose. This apparatus is shown in Figures 14 and 15. It is a modification of the gasket testing method BII(1) of the author's previous Methods of Test article.

As may be seen in Figure 15, a motor, through speed reduction gear, turns a sprocket wheel which acts on a spring scale. By applying force at a steady rate through a cord, the hose is raised and the force read on the spring scales. The hose test piece, which is 10½" in length, is slipped over a tight mandrel until a free length of 8" of hose remains. The mandrel is attached to a mechanism permitting rotation from the outside of the cold box. The other, or free, end of the hose is fitted with an aluminum adapter so arranged that the cord is automatically adjusted correctly when the hose is turned for measurement. Force required to deflect the hose is deter-

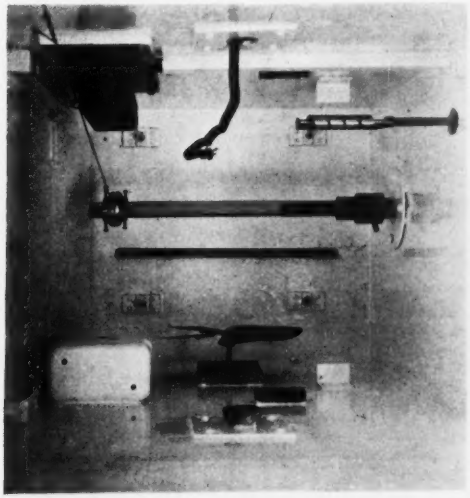


FIG. 14—Interior view of cold box showing hose specimen in position for low temperature flexibility test.

FIG. 15—Over-all view of cold box showing apparatus for low temperature flexibility test.

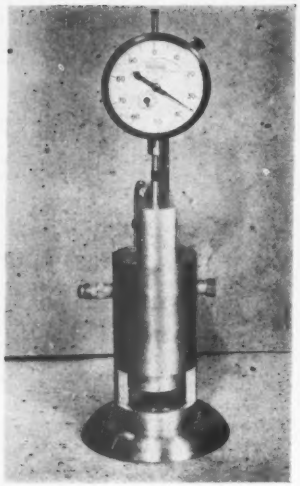


FIG. 16—Close-up view of Morris Compressometer.

mined in each of four positions, i.e., 0°, 90°, 180° and 270°. Cold air refrigeration is used in order to avoid the possibility of leaching effects which might result from cooling the hose in a liquid medium like methanol.

The test is made after a conditioning period of 94 hours, or other desired length of time, to insure that no substantial further changes in hardness and in the flexibility will take place. By measuring the force of deflection at four different positions, it is possible to overcome differences which might result from the wire and fabric reinforcement within the hose.

Morris Compressometer Test: The evaluation of rubber to determine its characteristics after having been exposed to low temperatures for appreciable periods of time has been given much thought in recent years. The low temperature compression set test listed under BII-(11) of the author's previous article on test methods has been extensively used for this purpose; so has the Swenson seal aging tester, listed in the parent article under C14 when adapted to low temperature measurement. This will be discussed later on.

Mr. Morris of the Rubber Laboratory at the Mare Island Naval Shipyard recently developed a compressometer which is intended to measure stress relaxation. It was originally developed to measure stress relaxation at the high temperature of 194°F. It is discussed in detail by Mr. Morris in a recently published article.* However, it is equally suitable for measuring stress relaxation which occurs in the rubber as a result of exposure to low temperature. The photograph of the compressometer is shown in Figure 16. The details of the individual parts are given in Figure 17.

The compressometer contains an air-operated piston which compresses the specimen to an extent dependent upon the stiffness of the rubber and on the air pressure acting on the piston. The rubber specimen is a round cylinder, ½" in height and ¾" in diameter. There is a depression 1/64" deep and ¾" in diameter in the center of the bottom face of the piston and in the center of the base plate to facilitate positioning of the specimen and to prevent the specimen from slipping during compression.

The cylinder has an air inlet connection and a pressure gage connection opposite the inlet connection. The clearance between the cylinder and piston is such that the piston falls freely under its own weight, but responds to the slightest movement within the rubber. Once the rubber has been deflected to the desired extent, the piston is locked in position by means of a knurled nut on the threaded piston rod which tightens against a cross bar.

At intervals during the conditioning period, the compressometer is removed from the oven or from the low temperature chamber in order to determine the residual stress exerted by the compressed rubber. This is accomplished by temporarily increasing the air pressure until a micrometer gage shows a downward movement of the piston. The various metal parts of the compressometer take up a slack of 1 mil downward movement. When the residual stress of the rubber is in equilibrium with the air pressure, a deflection between 1 and 3 mils is indicated on the dial gage. Since the effective area of the piston is 5 times the area of the rubber specimen, the residual stress exerted by the rubber in pounds per square inch is directly equal to five times the air pressure measured at equilibrium.

A correction factor of 1.2 pounds, which is the weight of the piston and its attachments, can easily be disregarded when calculating the residual stress. For evaluating the behavior of rubber at low temperatures, it is important that the air used in the compressometer is dried and chilled to the temperature at which the rubber is being tested; otherwise the rubber would undergo changes in temperature as a result of the air escaping between cylinder and piston.

The extent to which the compressometer can be used in lieu of the low temperature compression set test, low temperature seal aging test and hardness tests, and to measure stress relaxation at low temperatures is being exhaustively studied by the Rubber Laboratory at the

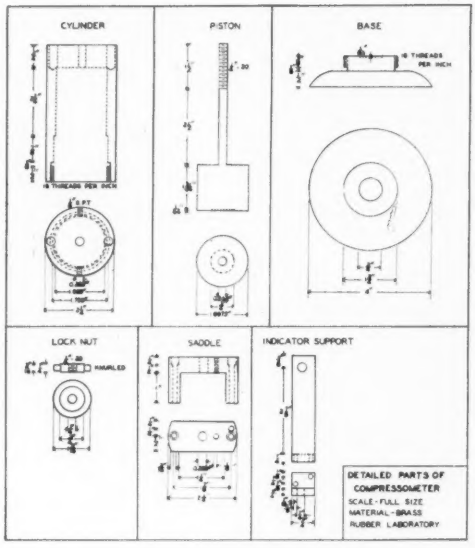


FIG. 17—Detailed parts of Morris Compressometer.

* Effects of Some Accelerators on the Physical Properties of Nitrile Rubber Vulcanizates," by Morris, James and Seegman, *India Rubber World*, Vol. 119, No. 4, p. 466 (Jan., 1949).

FIG. 18—Apparatus for low temperature compression set by liquid immersion.

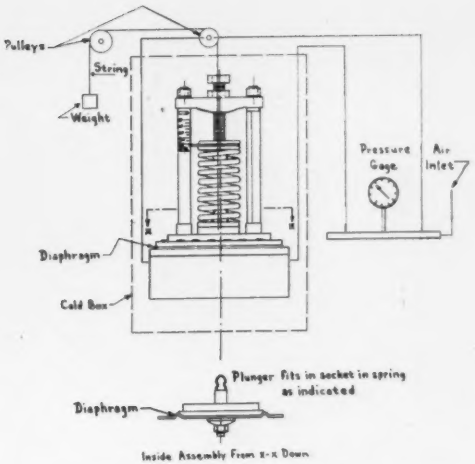


FIG. 19—Low temperature diaphragm test apparatus.

Mare Island Naval Shipyard and the Material Laboratory, Naval Shipyard, New York.

Special Liquid Immersion Equipment for Low Temperature Compression Set: The Rubber Laboratory at Mare Island developed special automatically controlled equipment for determining low temperature compression set. This apparatus consists of a cold methanol conditioning tank with its auxiliary apparatus and is shown in Figure 18. One advantage of the system developed by the Rubber Laboratory is that the temperature may be modified rapidly and maintained accurately over any desired range by means of a Tag Celectray indicating controller and recorder.

In general, it is believed desirable to conduct approval and inspection testing of low temperature properties in cold air chambers. However, where large numbers of tests must be run in research investigations where all compounding ingredients are known, the use of methanol bath immersion equipment such as that described above has been found entirely satisfactory. Present indications are that A.S.T.M. will also standardize on cold air chamber method of cooling.

Diaphragm Flexibility Test: In evaluating the behavior of diaphragm action at low temperatures, it is impractical to utilize low temperature compression set or seal aging tests, because the composite action of rubber and reinforcement must be evaluated. The Rubber Laboratory, Mare Island, therefore, developed special equipment to determine behavior of rubber diaphragms and fabric-impregnated rubber diaphragms under low temperature conditions. Since it was desirable to measure not only the stiffness of the diaphragm as the temperature was lowered, but also the rate of response, an apparatus simulating a typical diaphragm assembly was set up. A diagram of the apparatus is shown in Figure 19 and a photograph of the equipment is shown in Figure 20.

The apparatus consists of a spring assembly complete with flange, nuts, washers and connecting rod. The apparatus was so designed that a measured and controlled air pressure could be applied on the side of the diaphragm opposite the spring pressure controlled side. A position indicator consisting of a string and pulley arrangement shown in Figure 19 is used so that measurements of the diaphragm movements could be made at low temperatures without opening the conditioning chamber. The string is maintained tight by attaching a weight to it. After chilling the diaphragm assembly, the air pressure is raised at the desired controlled rate, and the displacement of the spring which measures the flexibility and movement of the diaphragm is then read for different operating pressures.

While the apparatus was originally designed to measure the behavior of special fabric-impregnated rubber and synthetic rubber diaphragms, the equipment can be used to evaluate the functioning of other diaphragms by modifying the calibrated spring and the corresponding air pressure fluctuation.

Modified Cantilever Beam Flexural Tests: The method described in BII(3) and illustrated in Figures 18, 19, 20 and 21 of the parent article previously referred to has been considerably improved by the Material Laboratory at the New York Naval Shipyard. The improved equipment is illustrated in Figure 21. By

FIG. 20—Assembly for low temperature diaphragm test.

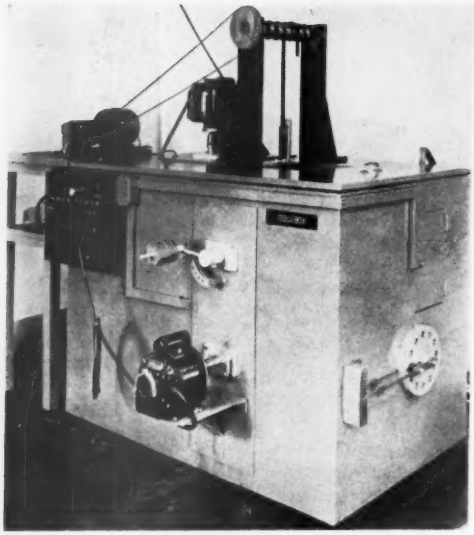


FIG. 21—Cold box showing automatic raising mechanism for gasket low temperature flexibility test.

means of this improved equipment, the raising of the rubber specimens is completely automatic and is accomplished through the use of sprockets rotated by means of a motor-driven reduction gear assembly. The spring scale is attached to a sprocket chain which is moved as the sprocket is rotated.

Rapid Action Compression Set Apparatus: When the low temperature compression set tests were first conducted as described in Method BII(11) of the parent article, it was not realized that the measurement of the compression set which the rubber has taken must be carried out as rapidly as possible after removing the load. In order to measure the compression set as expeditiously as possible, the mechanism shown in Figures 22 and 23 was developed by the Material Laboratory at the New York Naval Shipyard.

It will be noted that a vise is mounted in the cold chamber so that the compression set plates can be securely held in it, after the proper conditioning period, to remove the bolts. All manipulations are made through the handholes shown in Figure 22. With the apparatus shown, and using two operators, no difficulty was experienced in making thickness measurements of the rubber specimens within 10 seconds after removal of the load. In order to measure the extent of recovery, at the same low temperature, thickness measurements of the compression set specimens are again taken after suitable intervals of time such as 5, 10 and 30 minutes after removal of the load.

It is desirable to emphasize at this point the necessity for measuring the compression set taken by the rubber as soon as possible after release of the load and again after an appreciable interval of, say, 30 minutes, in order to measure recovery. It is very important to point out the major difference in low temperature compression set test and the usual compression set test generally taken at elevated temperature. The low temperature compression set test measures performance of rubber under actual service conditions. On the other hand, the high temperature compression set test is generally an *accelerated* test used to gage the probable behavior of rubber which it will show over an extended period of time when used at substantially room temperature.

C-Clamp Method for Cold Compression Set: The Materials Testing Laboratory of the Portsmouth Naval Shipyard is responsible for an interesting technique for making 10-second thickness measurements on compres-

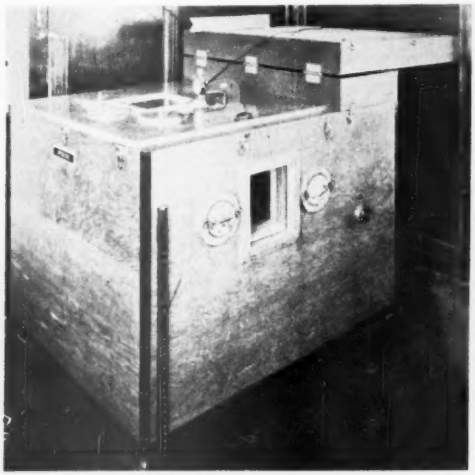


FIG. 22—Low temperature test box showing handholes in lid for internal manipulation of compression set apparatus.

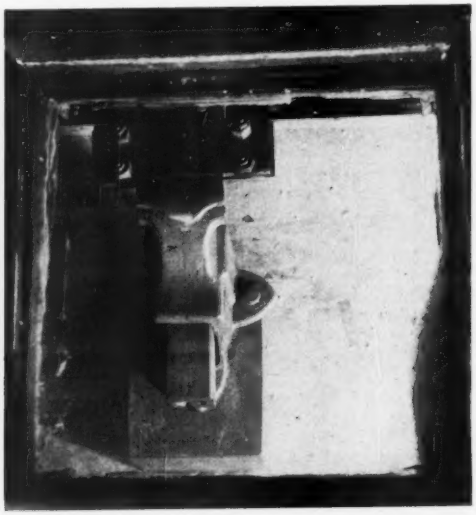


FIG. 23—Detail of low temperature compression set apparatus for method of the Material Laboratory of the New York Naval Shipyard.

FIG. 24—Apparatus for C-clamp method of cold compression set.

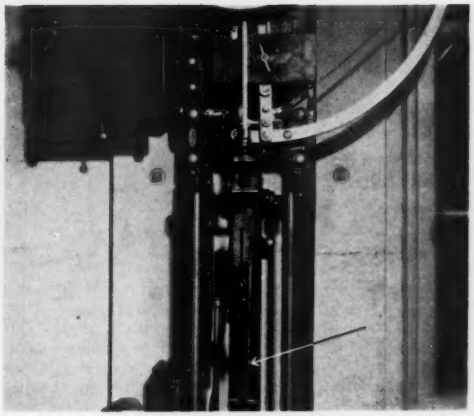


FIG. 25—Spring scale modulus test equipment.

sion set specimens, as shown in Figure 24. In order to accelerate the removal of specimens from the compression plates, one large C-clamp is substituted for the customary four bolts. Specimens are placed between the plates and compressed by tightening as usual the four bolts uniformly until the plates make contact with the spacer pieces. A large C-clamp is then made fast over the center of the plates directly over the rubber specimen, and the four bolts are removed before conditioning for the desired length of time at the low temperature.

The substitution of the C-clamps for the conventional four bolts ordinarily used on compression plates permits more rapid release of the specimen and results in higher precision of low temperature compression readings. It is, of course, essential that sufficiently strong C-clamps are used which will retain the degree of compression sustained by the four bolts.

Low Temperature Sealing Tests: The Swenson sealing test apparatus, discussed in the parent article under Section C14, is being used for low temperature evaluations. Samples are placed in the instrument in the same manner as for the high temperature seal aging test and the indenter point is placed into the rubber to the desired extent, usually 1/16ths of an inch. The entire apparatus is then placed in a low temperature box or air chamber and conditioned. It is important that the conditioning period is sufficiently long so that changes in the rubber resulting from crystallization and/or "second order of transition" have occurred.

Since the Swenson tester is utilized to determine stress decay as well as sealing characteristics at low temperatures, two distinct techniques are utilized. In the first method, a constant air pressure is applied through the perforated indenter. For most shipboard uses, a 25-pound pressure is used. While the pressure is being applied, the indenter is retracted 0.005-inch at a time until leakage occurs. During the test, the apparatus is contained in the low temperature chamber and manipulations are made through the handholes provided in the box for this purpose. A variation of this technique is to start at high air pressure, say 120 to 200 pounds per square inch, and to determine the sealing pressure for each setting of the indenter in .005-inch stages.

The second technique is comparable to the regular seal aging test, except that, in lieu of oven aging, the apparatus is maintained at the desired low temperature. The air pressure which is required to cause leakage after low temperature exposure at any given indentation is measured.

RHEOLOGICAL TYPE TESTS

Relative Modulus Test: Personnel of the Puget Sound Naval Shipyard developed a modulus test in order to aid in studying the viscosity behavior of self-curing hose cover patching material of the liquid polysulfide type. The test involves measuring the relative modulus, which is the ratio of two moduli before and after a suitable aging period. When the modulus values are low and within 10 percent of the machine's capacity, difficulty is experienced in accurately measuring the load with a Scott Tester.

To overcome this difficulty, measurement of the modulus is determined on a spring scale. The Scott Tester

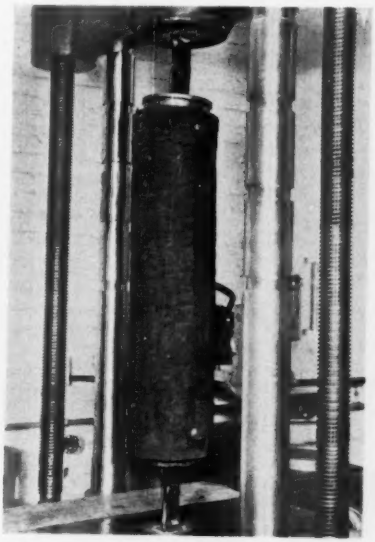


FIG. 26—Hose assembled for kinking or buckling resistance test.

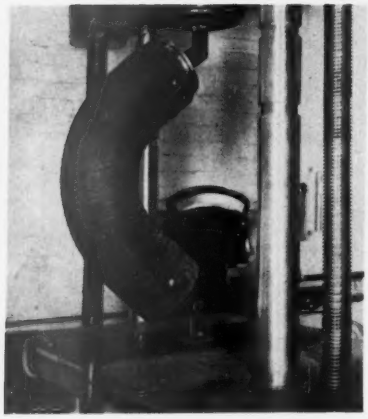


FIG. 27—Hose shown in final position at completion of kinking test.

is operated so that the jaws separate at the rate of 1¼" per minute. A spring scale is placed between the grips of the Scott Tester and the tensile specimen, as illustrated in Figure 25. By this arrangement, the operator is enabled to read the load on the spring scale corresponding to any selected percent elongation. The method is applicable for all sorts of materials which have extremely low modulus values, and thus broadens the usefulness of the test method.

Hose Kinking or Buckling Resistance Test: Personnel of the Mare Island Rubber Laboratory developed an excellent kinking or buckling test for hose. The test is performed on sections of hose 24" long. Metal plugs are inserted into the ends of the hose section and bolted in place as shown in Figure 26. The remaining or free length of hose is 18" long. This assembly is placed between the moving platen and cross head of a Baldwin-Southwark Universal Tester. The platen of the tester is raised at the desired rate until kinking occurs. Figure 27 shows the final position of a section of 6" rough bore hose when kinking has taken place. The kinking point is determined readily, because there is a sharp drop in the load required to cause further deformation.

Hose Crushing Resistance Test: A simple crushing resistance test for wire reinforced hose was likewise developed by Rubber Laboratory, Mare Island Naval Shipyard, personnel. The set-up for the test is shown in Figures 28 and 29, respectively. In order to exert uniform pressure, a 12" square steel plate ½" thick is securely bolted to the moving crosshead of the Baldwin-Southwark Universal Tester. Since there is no certain crushing point, the load versus deformation must be plotted. Resistance to crushing is then designated as the load required to deform the hose permanently after deflection of a certain degree. The point at which the slope of the curve, obtained from the plotted data, shows a pronounced change is taken as the point of failure.

(To Be Continued)

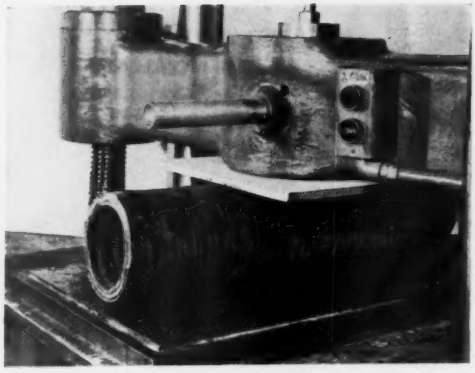


FIG. 28—Hose and plate assembled for crushing resistance test.

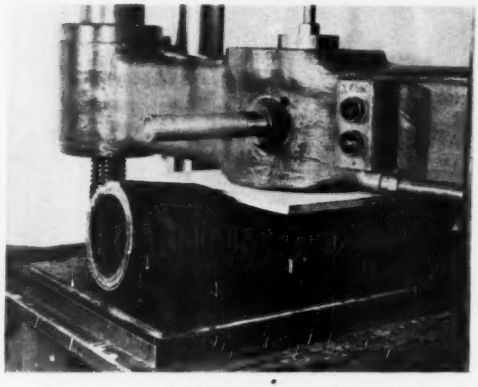


FIG. 29—Hose during crushing resistance test.

The first true **universal monochromator,** which covers the ultraviolet, visible and infrared regions of the spectrum (18 to 40 microns) when suitable prisms or gratings are used is now in production by the Perkin-Elmer Corp., Glenbrook, Conn. It is called the Model 83 Monochromator.

Mixing Equipment Co., Rochester, N. Y., has announced the development of a new **weight-loaded lubricator.** It is designed to deliver lubricant at constant pressure in any desired quantity and may be used for greases and oils. Typical uses include application of lubricant to stuffing boxes of pumps and mixers, motors and engines, and heavy machinery.

The development of a new production control instrument in conjunction with the Dow Chemical Co. has been announced by the Precision Scientific Co., Chicago 47, Ill. Called the **Robomatic Refractometer,** it controls the flow of industrial process streams by refractive index instantaneously and continuously and graphically records the results 24 hours a day. Specific applications include the manufacture of both synthetic rubber and plastics.

Panel Discussion on Rubber Mixing Equipment

Sponsored by the Los Angeles Rubber Group at its Meeting on October 4, 1949

MANY questions relating to the proper use and the comparative effectiveness of rubber mixing equipment were raised at the Panel Group Discussion sponsored by the Los Angeles Rubber Group at the Hotel Mayfair in Los Angeles, Calif., on October 4. A panel of five experts attempted to answer the questions as they were raised from the floor. Neil Pestal (Firestone) acted as moderator for the session. The panel included: Tway Andrews (H. M. Royal); George Miller (W. J. Voit); Paul Oliver (Farrel-Birmingham); Phil Drew (Goodyear); and Charles Kuhn (Master Processing). In view of the importance of the subject matter discussed at the meeting, the questions and answers are presented herewith:

Question No. 1—What is the comparative effectiveness of open end vs. closed end mill cooling?

Answered by Mr. Drew: Open end cooling eliminates the possibility of drain back pressure which usually amounts to 5 to 10 lbs. in the closed end cooling. Open end cooling also allows a more effective spray cooling, as the spray pipe can at all times be kept above the level of the cooling water, permitting the sprays to intimately contact the roll surfaces and provide better cooling.

Question No. 2—What is the importance of clearance between tube machine screw and barrel?

Answered by Mr. Drew: If the clearance between the tube machine screw and the barrel is not kept very low, too much stock flows backward over the screw, resulting in loss of production and scorched stock. New machines should be set up with a diameter clearance of .001 to .002 per inch between the screw and the barrel. Tube machine clearance should be reduced when it gets up to or over .006-inch in diameter clearance between the screw and the barrel.

Question No. 3—What is the best method for keeping scale off the inside of mill rolls?

Answered by Mr. Miller: The best method, of course, is to soften or treat the cooling water. Softening plants require a considerable outlay of money for original equipment and also for maintenance. Calcium and magnesium scaling can be prevented by dosing the water with a sequestering agent, such as sodium tripolyphosphate. Here, the cost of equipment is quite nominal. With water of medium hardness, cost for the sequestering agent would amount to only a few cents per 100 gallons of water treated. To be economical, this method would require a closed circuit cooling water system.

"Stars" or "Jacks" are often placed inside the rolls. These are irregularly shaped pieces of iron which scour out the scale as the roll turns and tumbles them around. If stars are used, the inside of the roll should be inspected frequently to see that stars do not group together and score the inside of the roll. Rolls have been known to fail at such score points.

Probably the most acceptable method is to dissolve out the scale at frequent intervals by means of an inhibited acid. Inhibited acid is readily available from reputable manufacturers who will recommend the proper acid and equipment for the job. An acid circulating system with pump, tanks and accessories is easily and cheaply built, and this method for removing scale is simple, safe and economical.

Question No. 4—On an open mill what is the most practical mechanical device for automatically returning to the bank, powder that falls through mill rolls?

Answered by Mr. Miller: The best device for returning powders to the bank is an apron mill. The mill apron is an endless belt which runs into the mill pan and backs up over the roll. The belt is usually as wide as the rolls are long so that it picks up all powder droppings and returns them to the bank. The belt is driven by friction contact with the rolls, and may be raised and lowered by means of a pneumatically-operated cable. While the mill is being loaded it is kept in a lowered position. As droppings accumulate, it is raised to a roll contact position, which causes the belt to move, bringing powders into the bank. Apron mills may be purchased as standard equipment from any of the manufacturers of rubber mills.

Members of the Panel Group: TOP ROW—Tway Andrews (Royal), Dickson Sheppard (Goodyear), Phil Drew (Goodyear). BOTTOM ROW—Charles Kuhn (Master Processing), Paul Oliver (Farrel-Birmingham), George Miller (Voit). Mr. Sheppard is chairman of the Technical Committee of the Los Angeles Rubber Group.

Question No. 5—With reference to pigment loss and tailings, what are the different types of dust rings used on Banburys?

Answered by Mr. Oliver: A number of different type dust stops have been used since the Banbury Mixer was first designed; however, the most successful types to the present time is type "D" and type "F." The type "D" has a floating friction ring which is loosely keyed to the rotor shaft and the seals made by pressure being applied to a bronze gland ring which forces the friction ring against the collar on the end frame ring. The type "F" dust stop has a hardened collar which is shrunk on the rotor shaft and extends through the end plate, the seal being made by the dust stop gland ring which presses against the rotor collar by means of spring tension.

There is a question as to the relative merits of these two types of dust stops as some companies prefer the type "D" and others the type "F." It is my opinion that either type of dust stop will work successfully, provided they are properly maintained. The usual cause of failure to these dust stops are due to improper spring tension and lack of lubrication. In case the lubricator runs out of oil or fails to supply the proper amount, the oil holes in the gland rings become stopped up, thereby allowing the rings to wear and compounds to pass by the stops. I believe that approximately 75% of the losses around the dust stops can be prevented through proper maintenance of the equipment.

The sight glasses on the lubricator should be kept clean at all times and periodic inspection made to determine if the lubricator is working satisfactorily. It is also very important that any accumulation of stock around the dust rings be removed, to allow them to float freely.

Question No. 6—What are the minimum and maximum rotor clearances for Banburys?

Answered by Mr. Oliver: The standard rotor clearance between the rotor and shell of a size 11 Banbury Mixer is approximately 3/16". Many companies have used the Banbury until the clearance is as much as 5/8" and have experienced no mixing difficulties. There is one important fact however, and that is as the rotors and sides wear, it is necessary to increase the back size in order for the floating weight pressure to be maintained at all stages of the mix.

Question No. 7—What is the best method of handling sticky batches on mills, such as neoprene and high resin containing batches?

Answered by Mr. Kuhn: There are several items that can be considered: (1) Cool Mill; (2) Application of the mill rolls to (a) a chemical supplied to the rubber industry for that purpose, (b) sodium silicate, if contamination is not objectionable, and (c) very fine spray of solvent. Other items to be considered include: (3) Compounding; (4) Use of a scraper bar; and (5) Small batches.

Question No. 8—What is considered normal loss or shrinkage on the average No. 11 Banbury batch?

Answered by Mr. Kuhn: Normal loss is approximately between 1 and 2% and somewhat higher with stocks that are heavily loaded. Keeping the dust rings and sliding gate in best working condition keeps this loss to a minimum.

Question No. 9—What are the new State Safety Regulations (in California)?

Answered by Mr. Andrews: Although many in the industry are of the opinion that there is currently a State Safety Code which covers stopping distances and other comprehensive features as regards safe mill operation, this is not true. At the present time very complete general safety orders are being prepared by the Division of Industrial Safety of California and these should be put into law within the next year.

The proposed order follows the stopping limits of the American Standards Association's Safety Code for Rubber Machinery in general. It also specifies such things as the location of the trip rods or cables and also minimum height of mill rolls. As regards the latter, one important change has been made in the proposed order and that is that on old installations it will be satisfactory to have the top of the front roll no less than 42 inches above the working floor level and only on new installations does the top of the front roll have to be a minimum of 46 inches above the floor. As originally written, the law would have called for all rubber mills having the top roll located no less than 46 inches above the floor.

Question No. 10—What are the usual mill ratios and what is their effect on different types of batches?

Answered by Mr. Andrews: As would be expected, there is no uniform agreement among men in the industry as to the best ratio for any particular job. However, most seem to agree that ratios as high as 1.5 to 1, which were rather commonly used many years ago, is excessive, power consumption is increased and the heat softening effect is pronounced. Ratios around 1.1 to 1 are good for feed mills used to feed calenders or extruding machines. Mills with these ratios maintain the stock plastic, but the tendency to overheat and scorch is greatly reduced.

New England Insert Cavities

Readily machined and cut like hot rolled steel, insert cavities manufactured by the New England Tool Co., 64 Floral St., Taunton, Mass., are proving of use to molders of soft rubber and other products. Powdered metal molding cavities are made from medium carbon steel powders and contain no ingredients such as copper to taint the rubber. One of the advantages is the ability of the many hidden pores to retain mold lubricants, facilitating the flow of rubber and the stripping of molded parts. The insert cavities require no polishing, and need only simple machining to mount in mold plates. They are said to give faithful reproduction of delicate details and identical duplication of precise dimensions in any number of mold cavities. Powdered metal mold inserts may be chrome plated and are strong and durable, and their low cost and durability make them a valuable addition to the methods available to molders.

A new line of **manually-operated starters for a-c motors** up to 7½ h.p. has been introduced by the General Electric Co., Schenectady, N. Y. Adaptable for small pumps, blowers and grinders, the new starters are furnished in both toggle and push-button types. A feature of these starters is their bimetallic overload protection, which replaces the solder-pot relay and provides accurate response to overloads.

Editorials . . . . . .

Pending Recommendations

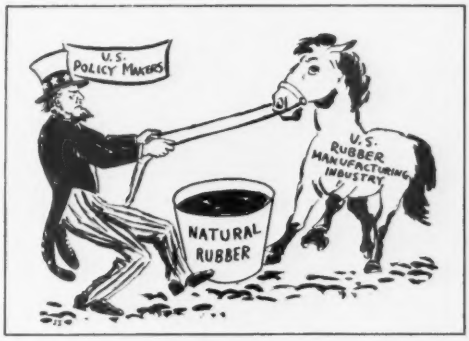
WITHIN the next several weeks specific proposals regarding the disposition of government-owned synthetic rubber producing facilities will be presented to members of the Truman Cabinet. As a result of these proposals, the President will recommend specific legislation on disposal to Congress. The terms of the Rubber Act of 1948 require that the President submit such recommended legislation prior to January 15, 1950, which means that the rubber problem will be high on the agenda of the new Congress.

The disposal recommendations soon to be placed in the laps of cabinet officials will represent the efforts of the Inter-Agency Committee on Rubber Legislation appointed several months ago by the White House. Some 15 administrative departments and agencies are represented on this committee, which has been meeting almost daily since last July. According to the Washington grapevine, a majority of the committee members are in favor of early disposal of the synthetic rubber facilities to private industry. The committee is also reported to have reached agreement with regard to the continuation of mandatory controls, but the agreement is a closely guarded secret.

The position taken by the majority of committee members is that although the problems which would follow in the wake of immediate disposal of the synthetic facilities combined with continuation of mandatory controls would be difficult they would not be insurmountable. The minority opinion, however, leans toward the argument that immediate plant disposal combined with retention of controls would leave unsolvable problems. The minority group further argues that there is no impelling reason to dispose of the plants now, but that they should be held until technical progress uncovers a polymer which would assure a large enough market to guarantee the continuation of a synthetic rubber industry adequate for military needs.

Coupled with the thinking of the minority group in the Inter-Agency Committee on Rubber Legislation is a new concept of rubber stockpiling which has resulted from a joint military-industry study of rubber requirements in the event of war. For example, it is now argued that the ratio of synthetic to natural rubber in another war should be between 4-to-1 and 3-to-1, on the contention that a good deal of wasted manpower and inferior products was witnessed toward the last few months of World War I when synthetic rubber represented almost 88% of total rubber consumption. This would indicate a desire to substantially increase the stockpile of natural rubber, with lessor need for synthetic facilities.

In any event, members of the Inter-Agency Committee are expected to unite on either the majority or minority opinions, or more likely a compromise between the two, so that a single program covering disposal of government-producing synthetic facilities and mandatory controls will be submitted to cabinet officials within the next several weeks. It is quite likely that this program will constitute the legislation recommended to Congress by the President within the next two months.



Will He Drink?

(Suggested by a reader)

CURRENT NEWS OF THE MONTH

MALAYAN RUBBER CONFERENCE SEEKS NATURAL IMPROVEMENT

Problems relating to the quality of natural rubber, and measures necessary for its improvement, were discussed at a meeting held in Malaya recently. The meeting was organized by the Board of the Rubber Research Institute, Malaya, and the Rubber Research Scheme of Ceylon, which was represented by its director, Dr. E. Phillis.

The official report on the conference stated the problem of quality is a complex one and the word is used rather broadly to include all the properties of rubber which are of importance to manufacturers of rubber goods. The growth of the U. S. synthetic rubber industry has been such that it is now clear that in the future natural rubber and synthetic will compete for the world market on a dual basis of price and quality.

Postwar developments, said the report, have led to improvements in synthetic rubber which are sufficiently great to offer a sharp challenge to natural rubber in a number of fields. Moreover, the vast sums spent in the United States on synthetic research may be expected to lead to further progressive improvement.

In the face of this threat it is essential for natural rubber producers to adopt a forward-looking policy and to seek to meet the synthetic challenge by improvements in the quality of natural rubber. The main subject before the technical session was a discussion of what improvements in quality can be effected without involving revolutionary changes in rubber production.

It was unanimously agreed that much could be done to assist the manufacturer to make more effective use of natural rubber by the introduction of a system of grading based upon technological properties of the material. At the present time natural rubber is criticized on two grounds, that it is dirty, and that its quality is variable, the report stated. The technical session concluded that these defects must be overcome as a minimum first step in the competition with synthetic.

Patent Pool Virtually Ended

According to reliable reports from Washington, D. C., the patent pool on synthetic rubber has virtually ended, unofficially but effectively. Terms have already gone out for signature to all U. S. participants, with the termination date retroactive to March 31, 1949. The only item holding up official announcement of the cancellation of the pool is said to be conclusion of a final agreement with the Canadian government, which was also a party to the pool.

Microfilms of "Rubber Age" Will Soon Be Available

As a service to public and industrial libraries, as well as to others who maintain copies over a long period of time, we have entered into an agreement with University Microfilms, Ann Arbor, Michigan, to make complete editions of RUBBER AGE available in microfilm form. The microfilms will cover an entire volume (of six issues) or two volumes if preferred. Use of microfilms is the answer to the pressing problem of providing adequate space for the large number of technical publications currently available. The microfilm is in the form of positive microfilm and is furnished on metal reels, suitably labeled. Inquiries concerning purchase of RUBBER AGE microfilms should be directed to University Microfilms, 313 North First St., Ann Arbor, Michigan.

Raise Tire and Tube Prices

Major tire producing companies throughout the nation have raised their prices for all tires and tubes by 3½%. It was generally the view of producers that manufacturing and distribution costs were out of line with prices, necessitating an adjustment. Other manufacturers were of the opinion that the 3½% figure was not enough, and predicted further price adjustments by the end of the year. Smaller companies had long urged the upward revision of prices, claiming they could not meet the competition of the larger companies at the then current competitive prices. The price rise was touched off by the Goodyear Tire & Rubber Co. on October 26. All other major tire producing firms quickly followed suit. Large tire companies have experienced marked declines in earnings in the first half of 1949. Some of the smaller competitors have reported losses. Tire price cuts in June and July were pointing to an even greater decline in profits for the second half of this year.

Twin City Rubber Works Moves

Twin City Rubber Works, formerly located at 321 West Lake Street, Minneapolis, Minn., has moved to new and larger quarters at 2619 Washington Avenue North, Minneapolis 11, Minn. The new telephone number is Cherry 2446.

ASME RUBBER-PLASTICS GROUP SET TO HOLD ANNUAL MEETING

The Annual Meeting of the Rubber and Plastics Division of the American Society of Mechanical Engineers will be held on Tuesday, November 29, at the Hotel Statler in New York City. The meeting of the Division will be held in conjunction with that of the parent society.

The Division meeting will feature the presentation of four technical papers in addition to development reports on the advances in plastics and rubbers. Two sessions will be held, one in the morning on plastics and the other in the afternoon on rubber. The program follows:

Plastics Session: "Long-Time Tension and Creep Tests of Plastics," by C. E. Staff, H. M. Quackenbos, Jr., and J. M. Hill (Bakelite Corporation, Bound Brook, N. J.); "A Theory of the Mechanical Properties of Hot Plastics," by Samuel J. Loring (Plax Corporation, Hartford, Conn.); "Advances in Plastics: 1948-49," by J. E. Faloon (Chemical Department, General Electric Co., Pittsfield, Mass.).

Rubber Session: "Compression-Stress Relaxation of Some Rubber and Synthetic Rubber Vulcanizates," by J. R. Beatty and A. E. Juve (B. F. Goodrich Research Center, Brecksville, Ohio); "Design Data on Natural and Synthetic Rubbers for Mechanical Engineers," by E. F. Riesing (Firestone Industrial Products Co., Noblesville, Indiana); "Advances in Rubber: 1948-49", by Lois Brock, G. H. Swart, and E. V. Osberg (General Tire & Rubber Co., Akron, Ohio).

All visitors are welcome at meetings of the A.S.M.E. Rubber and Plastics Division. No registration fee is required of members, but non-members are required to pay a registration fee of $5.00.

Plastics Engineers To Meet

The National Society of Plastics Engineers will hold its 1950 conference at the Hotel Carter in Cleveland, Ohio, on January 11 through 13. The conference will feature the presentation of twenty papers on original research in the plastics industry. Discussions will cover new developments and techniques in manufacturing plastics as well as new uses. Richard L. Huber (Hercules Powder), president of the Cleveland-Akron Section of the society, has been named conference chairman.

CANADIAN RUBBER INDUSTRY SHOWS GAIN IN EFFICIENCY

An interesting comparison between the relative efficiencies of the rubber industries in the United States and Canada was made by E. G. Holt in a recent issue of the Rubber Industry Report, the bi-monthly report issued by the U. S. Department of Commerce. Canada is the only important foreign country for which statistics permit a direct comparison with the United States industry.

The rubber manufacturing industry in Canada experienced an expansion similar to that of the United States in the period from 1939 to 1947, as indicated by data in the 1947 census recently released. The value of products in Canada increased 180.7 per cent in 1947 over 1939, compared with 215.5 per cent for the United States, while rubber (new and reclaimed) consumption increased 89.4 per cent compared with 81.7 per cent in the United States.

The Canadian unit prices of finished rubber goods averaged 48 per cent higher in 1947 than in 1939, whereas the United States increase averaged 73.5 per cent, with the U. S. tire industry showing the lowest increase (59.4 per cent) of any segment.

The average wage in Canada was much lower than in the United States in both years. The percentage increase in Canada almost paralleled that in the United States, but whereas in 1939 the Canadian wage was 72 per cent of that in the United States, in 1947 it had declined to but 66 per cent.

The efficiency of workers in Canada, measured in new and reclaimed rubber consumption per man, increased 11.5 per cent compared with a 2.3 per cent increase in the United States where, however, the rubber consumption per worker in 1947 was still far above that in Canada—13,562 pounds compared with 8,578 pounds. The discrepancy in pounds is chiefly due to the different classes of goods produced in the two countries, and to the smaller scale of operations in Canadian factories.

In general, therefore, the Canadian industry was able to get along with a smaller price rise, benefiting more than the United States from increased efficiency of labor compared with 1939, and having a wage scale lower in relation to the United States in 1947 than in 1939. It is inevitable that other foreign countries making rubber goods have experienced a similar trend, offering food for thought as to the long term implications for American labor.

The Canadian statistics show clearly that higher cost of textile fabrics was an important factor in the increased costs of materials other than new rubber, this item accounting for 16 cents out of each dollar of their 1947 sales compared with 11.2 cents in 1939. Cost of fuel and electricity increased somewhat more than the rate of increase in total rubber consumption.

The Canadian reports do not show the expenditure for plant and equipment, but even making liberal allowance for this item, the statistics indicate far greater percentage profits for the Canadian than the United States industry both in 1939 and in 1947. It is therefore probable that the industry would be in better position to reduce prices than the United States industry despite its lower price increase since 1939.

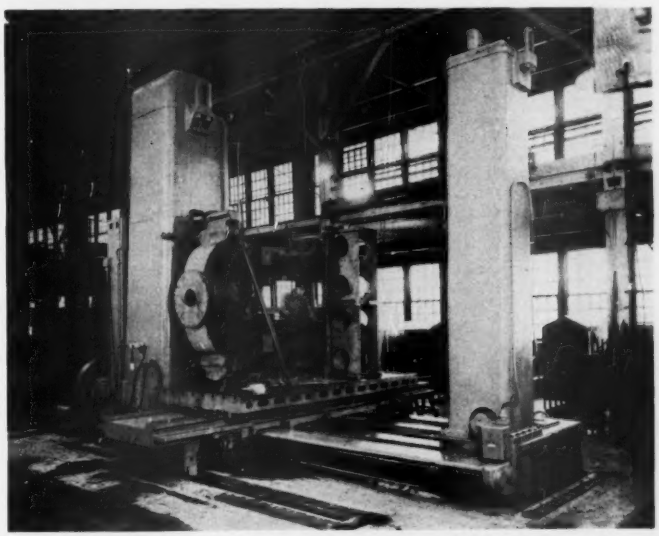
September Consumption Drops

Estimated new rubber consumption for September totaled 74,765 long tons according to a report issued by the Rubber Manufacturers Association. This is 4.90% less than the August consumption of 78,615 tons. Natural rubber used during the month amounted to 42,957 long tons, a reduction of 3.95% from August when 44,724 tons were used. Use of synthetic rubbers showed a decline of 6.15% to 31,808 tons from the 33,891 tons consumed in the previous month. Consumption of reclaimed rubber for September was estimated at 18,265 tons, about 5% less than the August consumption of 19,202 tons.

Plastic Cable Splice Housing

A plastic cable splice housing which is said to drastically reduce the time needed to splice power and signal cable and gives a durable water tight electrical seal, has been developed by the U. S. Rubber Co. The main structural part of the housing is a pipe made from a tough, corrosion-proof blend of synthetic rubber and thermoplastic resins. It is the same material from which the company is now manufacturing corrosion-proof plastic pipe for the chemical and mining industries. This pipe fits over the cable joint. Two rubber seals are used in the pipe to make a moisture-tight seal. Threaded plastic caps on each end of the pipe grip the cable and insure a tough, finished joint. The company plans to market the splice housing in two diameter sizes: 1.5 inches inner diameter for cable of one inch maximum thickness and 2 inches inner diameter for cables up to 1.5 inches maximum thickness. The pipe will be furnished in required lengths based on the length of splice. A special design has also been developed which will permit a "Y" splice connection.

ADAMSON UNITED INSTALLS GIANT BORING AND MILLING MACHINE



A large size horizontal boring and milling machine has been installed at the Akron plant of the Adamson United Co., manufacturers of precision equipment for the rubber and plastics industry. The mill installed, depicted above, is particularly adapted to handling heavy housings for calenders and mills, which weigh as much as 15 to 20 tons.

According to Adamson United engineers, great accuracy in machining is possible since these huge castings can be finish machined with fewer set-ups than are necessary when the work is done on conventional machines. The increased accuracy and added smoothness of all finished surfaces contribute much to precision of operation and decreased maintenance in the finished equipment.

In the plastic film industry the requirements for accuracy in the finishing calenders are much greater than in similar equipment for use with rubber. This is particularly true in the case of calenders which are used for rolling .004-inch film. Adamson United is convinced that their plastics calenders, the large castings of which will be finished in the new large size G & L boring mill, will give better service and have longer maintenance-free life.

SAFETY ENGINEERS' CONVENTION HEARS ADDRESS BY J. E. TRAINER

"Safety more than pays its way and is a wise investment for every industry," J. E. Trainer, vice-president in charge of production for the Firestone Tire & Rubber Co., told members of the American Society of Safety Engineers at their annual meeting in Chicago, Ill., on October 25. "A well-conducted safety program also improves the relationship between working force and supervisor and raises employee morale," he said.

The Firestone Company has received the National Safety Council's Distinguish Service to Safety Award for four consecutive years on a company-wide basis. Mr. Trainer was chairman of the Committee on Engineering for the President's Conference on Industrial Safety last spring.

Lag in Human Engineering

In his address before the safety engineers, Mr. Trainer noted that "the lag in human engineering behind technological engineering is tremendous, and in the minds of many, this lag contains the dynamite that could result in the destruction of civilization. Today we have the greatest moral responsibility of our times —responsibility of protecting the peoples of the earth from violent death or injury whether from industrial accidents, or from atomic wars. We must not shirk that responsibility."

Mr. Trainer pointed out that in many accidents there is damage to equipment as well as injury to employees, and in others damage to equipment or buildings even though there is no personal injury involved. Such avoidable accidents, as in the case of disastrous fires or explosions, entail losses of millions of dollars. Safety engineering contributes to the prevention of such damage. Mr. Trainer stressed, however, that accidents to property are of less importance than accidents to people.

Contribution to Production

Mr. Trainer listed safety engineering's contribution to production under three main categories: Lowered direct costs of accidents in the form of compensation and medical payments; lowered indirect costs for such things as work-delays and interruptions in production, and the improvement of production efficiency.

He named eight worthy ends safety engineering can accomplish in aiding production: (1) Reduce costly interruptions and delays; (2) improve the productivity of workers by better placement and training procedures; (3) benefit employee relations by use of the non-controversial subject of accident prevention; (4) improve worker's morale by increasing the desirability of work in a given company; (5) help train supervision do a better job with its workers; (6) increase loyalty of employees by the interest that they develop in maintaining outstanding safety records; (7) improve plant housekeeping, and (8) help design more productive, efficient equipment and help lay out more efficient plants.

Coming Events

Nov. 24. Quebec Rubber & Plastics Group, Canadian Legion Hall, Montreal, Canada.

Nov. 29. Rubber & Plastics Div., A.S.M.E., Hotel Statler, New York.

Dec. 4-7. American Institute of Chemical Engineers, Wm. Penn Hotel, Pittsburgh, Penna.

Dec. 9. Los Angeles Rubber Group, Xmas Party, Los Angeles Breakfast Club, Los Angeles, Calif.

Dec. 9. Detroit Rubber Group, Detroit-Leland Hotel, Detroit, Mich.

Dec. 10. Southern Ohio Rubber Group, Miami Valley Golf Club, Dayton, Ohio.

Dec. 13. Buffalo Rubber Group, Xmas Party, Hotel Westbrook, Buffalo, N. Y.

Dec. 16. N. Y. Rubber Group, Henry Hudson Hotel, New York City.

Dec. 16. Boston Rubber Group, Somerset Hotel, Boston, Mass.

Dec. 16. Chicago Rubber Group, Xmas Party, Morrison Hotel, Chicago, Ill.

Acquires Second Branch Plant

Russell Manufacturing Co., Middletown, Conn., has established a branch manufacturing plant at Lexington, S. C., for the production of nylon and cotton narrow elastic fabrics. A large building occupied by U. S. Air Forces during the war has been acquired on a long-term lease by Russell Products Co., Inc., a subsidiary of the Middletown concern. A battery of 40 Clutsom weaving machines, special high speed looms, has been moved to Lexington from Springdale, Conn., where they were recently acquired. Operations were scheduled to begin soon after November 1. The new plant is the second to be established in the south and the third to be acquired by Russell Manufacturing within recent weeks. On August 22, the company announced the establishment of a branch plant at Bennettsville, S. C., and on September 6, the purchase of the Howard Asbestos Co. of Northfield, Vt.

New Edition of Chemical Catalog

Reinhold Publishing Corp., 330 West 42nd St., New York 18, N. Y., has issued the 34th Annual Edition of the Chemical Engineering Catalog. The catalog, known as the 1949-50 edition, is a joint effort of the American Institute of Chemical Engineers, the American Chemical Society, and the American Section of the Society of Chemical Industry. As in previous editions, the latest number is divided into four sections, as follows: (1) An alphabetical index of firms represented; (2) Trade name index; (3) Classified index, and (4) Manufacturers' catalogs. The 1949-50 edition is dedicated to the memory of the late Ellsworth Wilbur Bennett, who served as production manager of the catalog for the past thirty years.

CELLULOSE DIVISION HEARS LYONS ON TIRE CORD TESTS

Development of a new electronic "twanging" machine which simulates the conditions that tire cord encounters in actual use was reported by Dr. W. James Lyons of the Firestone Tire & Rubber Co., at the meeting of the Division of Cellulose Chemistry of the American Chemical Society on September 20. The Division met in conjunction with the 116th national meeting of the parent society in Atlantic City, N.J.

When textile materials are being evaluated for use in such mechanical applications as tire cord and fan belts, it is important that their strength be studied while they are being flexed hundreds of times a second, said Dr. Lyons. He pointed out that the musical whine emitted by the tires of a speeding automobile is a good indication of the high frequency with which the cord structure of the tires is stressed and relaxed.

To copy this action in the laboratory, Dr. Lyons and his associates have invented a unit called the stretch-vibrometer. While a cord is being stretched, it is strummed by an electromagnet and voice coil of the type used in some radio loudspeakers, he explained. With the aid of this apparatus, it is possible to calculate energy losses, which represent the energy converted to heat in the fabric of a tire or mechanical belt.

"As the rate at which a yarn or cord is stretched and relaxed increases into hundreds of cycles per second," he continued, "its behavior departs more and more from what would be expected on the basis of the properties which it exhibits in the conventional laboratory 'static' tests, where loads are applied at a very slow rate.

"In some materials, the responses depart more from those under static conditions than they do in other materials. Under these circumstances the static data on various textile materials fail to give even a relative measure of the properties of the materials under conditions of dynamic service."

Analysis of extensive tests on a cotton cord and a nylon thread reveals that the amount of force needed to stretch them does not depend on the frequency of vibration, the weight of the vibrating parts of the machine, or the length of the particular sample being tested, according to Dr. Lyons.

It was found, however, that the greater the initial static tension applied to the specimen, the more force is needed to cause further stretching, he noted, and it is indicated that vigorous vibration produces more severe dislocations in the molecules of the textile and thus increases the amount of heat generated.

An interesting manual designed to be of assistance to the organization and administration of a corporation library is available from the Special Libraries Association, 31 East 10th St., New York 3, N. Y. Called "A Brief for Corporation Libraries," it is available at $1.75 per copy.

THREE PAPERS FEATURE MEETING OF THE NEW YORK RUBBER GROUP

The presentation of three interesting papers featured the Fall Meeting of the New York Rubber Group, held on October 21 at the Henry Hudson Hotel in New York City. In addition to the papers, presented at the afternoon session, the meeting featured the usual dinner, followed by entertainment consisting of several variety acts. Approximately 210 members and guests attended the meeting. Pete Murawski (DuPont), chairman of the group, presided.

The first speaker was H. B. Egmont Hake, Director of the British Rubber Development Board and former Chairman of the Rubber Growers Association. Taking as his subject "The Importance of Rubber in Southeast Asia," Mr. Hake first stressed the dependency of the Far East on rubber, stating that some 9,000,000 persons in Indonesia depend upon rubber for their livelihood while one-third of the working population of Malaya depend upon its sale. He then traced the development of rubber in Malaya and outlined how a civilization was carved out of a virtual jungle.

Refutes Malayan Monopoly

Refuting the idea that rubber activities in Malaya was a monopoly of any kind, Mr. Hake said that fully half of rubber production came from small and medium holdings, averaging about three acres each. He stated there was over 250,000 of these small and separate units, each as independent as a Vermont farmer. As to the profit angle, the speaker reported that a recent survey of 200 companies whose issued capital amounted to £34,000,000 indicated an average dividend over their entire life up to the war amounted to 7%. This figure, he said, was not a true one because it was based on the original capital, and if other expenses are taken into account the actual return on the total invested capital was closer to 4½%.

Mr. Hake then explained the strict labor codes which have been in effect in Malaya since about 1910 which, despite popular opinion, prevented the exploitation of the Tamils, Chinese and other laborers brought to the plantations. He also discussed the fact that Malaya did not enjoy the post-war booms witnessed in many other countries, which added to rehabilitation difficulties. In conclusion, he stressed the point that Malaya is important in the American economy, that it is the best hope of a free democracy in the Far East, and that its concepts of justice and concern for the rights of the individual are closely allied with those of American and the British Commonwealth.

Talk on Latex Production

The second speaker was Dr. Paul Stamberger, technical consultant and internationally-recognized authority on colloids, who gave a paper on "Trends in the Production and Consumption of Hevea Latex." Pointing out that whereas some 23,000 tons of latex solids were consumed in 1938 approximately 56,000 tons will be consumed in 1949, with the United States accounting for 60%, Dr. Stamberger said that surprisingly enough the trend in the type of latex supplied and used has not changed radically. Ammonia-preserved 60% latex, he said, still accounts for the major consumption.

Preservation of Latex

The speaker briefly discussed present preservation and concentration methods and told of developments made to replace ammonia as a preserving agent, particularly with sodium pentachlorophenate. Tests have indicated, he said, that this material is neither toxic nor a skin irritant when used in rubber in controlled quantities, and greater quantities of latex preserved with it are steadily reaching this country. This type of latex, he added, exhibits greater chemical stability and has no tendency for solubilization of zinc oxide.

Dr. Stamberger discussed the results of an investigation made to determine the storage behavior of various types of latices, using the specific conductance of the latices to detect degradation as well as the original ionic strength. Practically no changes were found in the latices preserved with sodium pentachlorophenate. He also discussed methods available to latex consumers to adjust the essential properties of their latices.

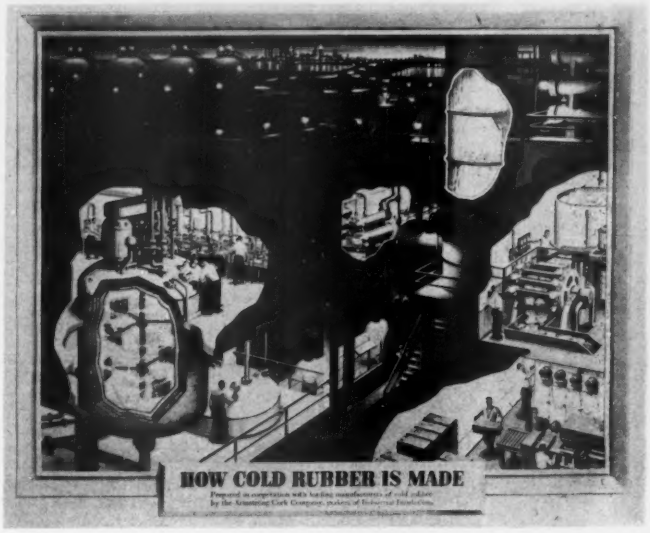
A large portion of Dr. Stamberger's talk was devoted to a description of the electro-decantation process for the concentration of latex. He showed several slides indicating the principles of the process and pointed out that the process is independent of the particle size and that no creaming agent is required. The properties of the concentrate, he added, are identical with those of centrifuged latex. In concluding his talk, Dr. Stamberger discussed several of the present methods of producing latex products. (EDITOR'S NOTE: Dr. Stamberger's paper will be published in full in an early issue of this journal.)

Vinyl Elastomers Discussed

A talk on "Vinyl Elastomers and Polyethylene," by A. F. Sward, Manager of the Calendering Materials Division, Thermoplastics Department, Bakelite Corporation, New York, was the final paper to be presented. Mr. Sward cited manufacturing procedures, properties, markets, etc., in the field of calendering, extrusion, molding and suspension coatings, and made comparisons with rubber in some of these fields. He demonstrated numerous end products as examples.

In his talk Mr. Sward revealed that whereas polyethylene in 1943 was available only in experimental quantities, some 50,000,000 pounds will be consumed during the current year. Consumption of vinyl resins, he stated, reached 230,000,000 pounds in 1948.

ARMSTRONG CORK ADVERTISEMENT EXPLAINS COLD RUBBER PROCESS



The story of how low temperature polymers, more popularly known as cold rubber, are made was told to the public in a full-color page advertisement in the November 19 issue of the *Saturday Evening Post*. Prepared by the Armstrong Cork Co., Lancaster, Penna., in cooperation with leading producers of cold rubber, the presentation briefly tells the chemical process followed in a typical plant. A cutaway view (illustrated above) illustrates the progressive steps. Enlargements of the cutaway view, 21 by 22 inches in size and suitable for framing, may be obtained without cost by members of the rubber industry by writing to Armstrong Cork.

BUFFALO GROUP HEARS WIARD SPEAK ON SILICONE RUBBER

The October 11 meeting of the Buffalo Rubber Group, held at the Hotel Westbrook, Buffalo, N.Y., was addressed by W. A. Wiard of the Sales Department of the Dow Corning Corp., Midland, Mich. Mr. Wiard spoke on the topic "Silastic — Its Properties and Place Among Synthetic Rubbers."

The speaker said that the early history of organo-silicon compounds goes back into the latter part of the last century. The principal background basis for the present silicone industry is the work of Professor F. S. Kipping of the University of Nottingham in England. His work in the investigation of low polymer organopolysiloxanes extended over a period of about 35 years, and contributed a great deal to the beginnings of the silicone industry in this country.

About 1932, the Corning Glass Works began further investigation in connection with electrical insulating materials, and soon after collaborated with the Dow Chemical Co. in the establishment of the Dow Corning Corp. Silicone rubber, manufactured by Dow Corning under the trade name of "Silastic," is one of the most interesting of the silicone family, noted the speaker.

In considering its properties, it should always be borne in mind that, at its present rate of development, silicone rubber does not compete with organic rubbers if the organic rubber is satisfactory. Mr. Wiard discussed the physical and chemical properties of a considerable number of silicone rubbers. This portion of his address was illustrated with slides.

It was pointed out that some compounds have brittle points in the neighborhood of —160° F., and yet are serviceable at 400° F. and above. A recently developed group of low compression set compounds was discussed. These compounds show remarkable resistance to compression set at extreme temperatures, said the speaker. The wide temperature range of extreme type Silastics was demonstrated by burying a number of fabricated parts in dry ice, and demonstrating that they were completely flexible after several hours.

The discussion was concluded with the showing of a group of slides depicting many interesting commercial applications of Silastic presently in use.

Akron Group Hears Leach

Approximately 300 persons attended the fall meeting of the Akron Rubber Group held on October 28 at the Mayflower Hotel in Akron, Ohio. The meeting was addressed by Paul R. Leach, chief of the Washington Bureau of the Knight newspapers, who spoke on "What's Cooking in Washington Today." Mr. Leach opined that wartime excise taxes on tires will be reduced next year. The next meeting of the group, scheduled for February 3, 1950, will include an afternoon symposium on rubber machinery, followed by dinner and an evening speaker.

Swelling of Neoprene

The swelling effect of oil-in-water emulsions was recently investigated by the DuPont Rubber Chemicals Division, Wilmington, Del. Contrary to popular notion, the results indicated that the swelling of neoprene in emulsions is not greater than its swelling in the oil alone. In fact, volume increase in certain oil-in-water emulsions containing up to 50% oil was not much greater than in water alone. The DuPont results were obtained using emulsions of ASTM No. 3 oil, an automotive radiator rust preventive oil, a cutting oil, and a wool processing oil. A complete report on the investigation will be issued in the near future.

Gates Club Hears Research Talk

The Gates Technical Club meeting of October 6, held at Cunningham's Restaurant, Denver, Colo., featured an address by T. A. Boyd, head of the Fuel Department, Research Laboratory Division, General Motors Corp. Mr. Boyd spoke on the theme "Headlamp of Industry," in which he presented his and Charles Kettering's views on an approach to industrial research, its place in an organization and the future of companies with respect to that department. The research organization, stated Mr. Boyd, is better able to do its work without constant interruptions to solve factory problems. The research division should devote its time to the solving of "pure" problems, and the value to the industry will naturally follow, he said. The technical meeting was preceded by a short cocktail session.

Thiokol Club Hears Bradley

Colonel Mark E. Bradley, Jr., Deputy Director, Procurement and Industrial Planning, Wright-Patterson Air Force Base, addressed the October 13 meeting of the Thiokol Technical Club at the Thiokol Corporation Laboratories, 780 North Clinton Avenue, Trenton, N.J. Colonel Bradley spoke on the subject "Procurement and Industrial Planning by the Air Force." He explained to the group, with the aid of charts and figures, how the Air Force purchases advance models of aircraft and other material as well as conventional equipment. The manner in which the Air Force evolves and places experimental orders to keep abreast of changing conditions and to avoid obsolescence was explained in some detail.

Division Issues New Directory

The Division of Rubber Chemistry of the American Chemical Society has issued a revised directory. The directory contains a complete membership list as of September 1, 1949, in addition to the recently elected officers and directors for the 1949-50 period. Copies of the directory have been supplied to all members of the Division.

SMITH ADDRESSES ONTARIO GROUP ON PROPERTIES OF CARBON BLACK

Approximately 50 members and guests attended the October 18 meeting of the Ontario Rubber Group held at Hart House, University of Toronto, Ontario, Canada. The meeting was addressed by W. R. Smith of Godfrey L. Cabot, Inc. Dr. Smith spoke on the subject "Recent Advances in the Surface Properties of Carbon Black and the Effect on Reinforcement."

In his talk Dr. Smith reviewed some of the advances in recent research dealing with the properties of carbon black. Particular emphasis was placed on the reinforcing grades of furnace blacks. Dr. Smith pointed out that electron microscope and independent surface area measurments indicate that reinforcing grades of channel blacks may possess a significant amount of internal surface which is not accessible to rubber. Reinforcing furnace blacks, on the other hand, are non-porous and hence this entire surface is available for reinforcement.

Dr. Smith also discussed structure and pointed out that all blacks possess structure to some degree. The significant factor is the strength with which the particles are held in the chains. The reinforcing furnace blacks stand intermediate between those generally recognized as displaying a high degree of structure and those of low structure such as the channel blacks.

New methods of analysis involving spectral emission have identified a number of the surface complexes which constitute volatile matter on carbon black. Reaction of these surface groups with dihydromyrcene was demonstrated. These data may prove significant in interpreting rate of cure and scorch problems.

In closing, Dr. Smith discussed research which had been carried out to evaluate the specific activity of carbon black surfaces. Heat of adsorption measurements show that the surface of carbon black is characterized by sites of high activity. Although the binding forces at these sites were found to be exceptionally strong, there is no indication that true chemical bonds are formed. The association between rubber and carbon black is undoubtedly physical in nature, he noted.

Southern Ohio Fall Meeting

Approximately 80 members and guests attendel the fall meeting of the Southern Ohio Rubber Group held on October 27 at the Engineer's Club in Dayton, Ohio. The meeting was addressed by Colonel G. W. Goddard, chief of the Photographic Laboratory of the U. S. Air Force. Colonel Goddard's talk included high speed photography of large land areas, day and night pictures, high altitude, and 3-dimensional pictures of New York, Chicago, Detroit and New Orleans, and moving 3-dimensional pictures of bombed German cities. Colonel Goddard was assisted by Carl Balcomb, project engineer on 3-dimensional pictures for the air forces.

CONNECTICUT ELECTS OFFICERS TOURS ARMSTRONG RUBBER PLANT

Approximately 110 members and guests attended the fall meeting of the Connecticut Rubber Group held on November 4 at the plant of the Armstrong Rubber Co. in West Haven, Conn. The meeting featured an election of officers for the 1950 season, and a tour through Armstrong facilities. At a short business meeting preceding the tour, the following officers were elected:

Chairman, Donald Spengler (Sponge Rubber Products); *Vice-Chairman*, Carl A. Larson (Whitney Blake); *Secretary*, G. R. Sprague (Sponge Rubber Products); *Treasurer*, Francis Rooney (General Electric). The following members were elected directors for the 1950 season: G. Maassen (R. T. Vanderbilt), D. Welch (Naugatuck Chemical), Emil Schwartz (Southern Clays), and H. V. Allison (Allison).

The 110 members were escorted through the Armstrong plant in groups of six, beginning with the finished tire and observing each operation of tire building back to the raw materials. Of particular interest to the members was a four roll calender and its intricate operation. At the conclusion of the tour, Armstrong furnished refreshments for the group.

Future group meetings are scheduled for February, April and September, 1950. The exact dates will be announced at a later date. However, the February gathering will be a dinner meeting at the Hotel Barnum in Bridgeport.

Morningstar Appointed Agent

Morningstar, Nicol, Inc., New York 19, N. Y., has been appointed sales agent for the Houlton and Mars Hill, Maine, factories of the New England Starch Co., potato starch manufacturers. This combines the sales of the New England Starch Co. plants with the Aroostook Potato Products Co., a subsidiary of Morningstar, Nicol. The new sales arrangement, according to company officials, will assist potato starch users by establishing a continuous supply of high grade starch, eliminating variations in quality of output, and fluctuations in prices. The Morningstar sales staff, augmented by their subsidiary, Paisley Products, Inc., Chicago 16, Ill., will provide additional sales and service throughout the country by the many Paisley sales offices located in principal cities.

Develop All-Rubber Whistle

American Anode, Inc., Akron, Ohio, a subsidiary of the B. F. Goodrich Co., has developed an all-rubber whistle, without metal parts, for use in children's rubber toys. The new all-rubber whistle is of soft latex construction, with no hazards whatever to the crib toy user. Cylindrical construction of the rubber whistle can be altered to conform with the base of any rubber latex toy, and provides a perfect cementing edge so that it can be retained as part of the toy during the life of the plaything.

Joins Firestone Research Staff

Lorin B. Sebrell

Dr. Lorin B. Sebrell, who has been connected with research and development work in the rubber industry for 30 years, has been appointed a member of the staff of the Chemical Research Division of the Firestone Tire & Rubber Co., Akron, Ohio. Dr. Sebrell, a native of Alliance, Ohio, graduated from Mt. Union College in 1916, received his M.S. degree from Ohio State University in 1918 and his Ph. D. from the University of Wisconsin in 1922. He is considered one of the outstanding leaders of research and development in the rubber and plastics field, having pioneered in the discovery of many new chemicals and other products. He is a past chairman of the Rubber Division of the American Chemical Society, as well as having received the Charles Goodyear award of the society for outstanding scientific contributions.

Collet Chuck Made With Hycar

A spindle nose lathe collet chuck recently introduced by the Jacobs Manufacturing Co., West Hartford, Conn., is said to owe its superior performance to a rubber-flex collet designed and patented by Jacobs in 1944. The rubber-flex collet, according to the company, is composed of hardened steel jaws bonded and mechanically joined together with Hycar, a product of the B. F. Goodrich Chemical Co. Each collet has a full ⅛-inch gripping capacity and one rubber-flex collet will cover the range of eight split steel collets.

Swan Rubber To Build New Plant

Officials of the Swan Rubber Co. have announced the construction of a new plant in Bucyrus, Ohio, site of the company's headquarters. The new building will be 100 by 200 feet, and is expected to be ready for occupancy in approximately four months. Expansion of company facilities is due to the need for additional area for the manufacture of plastic hose and several other products.

CHASE ADDRESSES ONTARIO GROUP ON RUBBER MACHINERY ADVANCES

The November 8 meeting of the Ontario Rubber Section of the Chemical Institute of Canada held at McMaster University, Toronto, Ont., Canada, was addressed by Donald C. Chase, manager of the Rubber and Plastics Machinery Sales Division of the Farrel-Birmingham Co., Ansonia, Conn. Mr. Chase spoke on "Advances in Heavy Rubber and Plastics Machinery." Approximately 100 members and guests attended the meeting.

The speaker reviewed the latest designs of heavy machinery for processing rubber and plastics, pointing out that speeds, production and power requirements are being increased. Greater attention is being given to reduction of wear and maintenance. The importance of gauge control in calendering was stressed and various methods of overcoming roll deflection were discussed, including the crossed axis Z-type calender and calenders with rolls of very large diameter.

A recent design feature, said Mr. Chase, is the removal of gears from the machine and enclosing them in a separate gear unit, where they are not affected by heat and stresses created by the working elements of the machine. Another trend is toward the use of extruders, strainers and pelletizers to receive stock directly from a Banbury mixer without a sheeting mill. This results in labor savings and greater cleanliness.

Starrett Completes Extension

L. S. Starrett Co., Athol, Mass., has announced the completion of a new plant expansion housing the company's Hacksaw, Band Saw, Band Knife and Precision Ground Flat Stock Division. Now in full production, the new plant is said to embody the latest techniques in plant engineering. The building is of the monitor type, 114 feet wide by 408 feet long, entirely made of concrete, steel and special heat-resisting glass. With this new addition, Starrett manufacturing facilities now provide 9 acres of floor space devoted exclusively to the production of a complete line of mechanic's head measuring tools and precision instruments, dial indicators, steel tapes, hacksaws, metal and wood band saws, and precision ground flat stock.

GE-2557 Plasticizer

G-E 2557, a polyester-type plasticizer which is said to combine the desirable features of both polymeric and monomeric plasticizers, has been introduced by the Chemical Department, General Electric Co., Pittsfield, Mass. Offered to vinyl and rubber compounders, the new plasticizer is said to have outstanding permanence and a wide range of compatabilities. It is also said to have unusual heat and light resistance and low volatility, while its low viscosity makes for easy handling. Other features claimed for the new material include low-temperature flexibility, excellent extrudability, and excellent pigment wetting characteristics.

SCHREIBER AND MORRIS ADDRESS BOSTON RUBBER GROUP MEETING

The October 14 meeting of the Boston Rubber Group, held at the Somerset Hotel in Boston, Mass., was addressed by A. P. Schreiber, Industrial Sales Manager of Tracerlab, Inc., Boston 10, Mass., and Dr. George E. Morris. Approximately 290 members and guests attended the meeting. Mr. Schreiber spoke on "The Use of Radioisotopes in the Plastic and Rubber Industry." Dr. Morris chose as his subject "Health Hazards in the Rubber Industry."

At the conclusion of the talks, the meeting chairman, Bernard H. Capen (Tyer Rubber), appointed a committee of three to handle the details of the forthcoming ski outing. The committee consists of Walter Edsall (Goodyear-Windsor), A. W. Bryant (Binney & Smith) and B. Mayo.

Mr. Schreiber said although nearly 10,000 shipments of radioisotopes have been made from Oak Ridge, they have been utilized very little by the rubber and plastics industries. A number of very practical uses for them have been devised which will be of considerable interest to these manufacturers. The speaker described a continuously indicating non-contacting thickness gauge for use directly on the calender. This gauge, which uses beta emitting radioisotopes manufactured at Oak Ridge, can be used for measuring non-uniformities both along the length of the sheet as well as across its width.

Other plant and research uses of isotopes were described by the speaker. Some of these have actually been used or are potentially valuable, such as tank gauging instrumentation, highly specific gravity gauges, and corrosion and erosion studies by the utilization of tracer techniques.

Incidence of Dermatitis

In his address, Dr. Morris said if one were to survey plants, and ask each employer which part of his plants was the most expensive, the most easily broken down, and the most difficult to repair or replace, one would probably get a multitude of answers—this mixer, this spreader, this washing apparatus, etc. With little trouble, however, it can be proved that the single most expensive and fragile part of any factory is the worker's skin.

The skin, in general, causes 60 to 70 per cent of all industrial diseases. Besides being a covering for the body, the skin has at least seven other functions. It regulates the body temperature, forms antibodies, stores sugar, receives impulses, forms Vitamin D, prevents loss of fluid, and protects against outside irritants.

The skin was meant to be surrounded by air and not by chemicals. There are two great classes of substances which cause skin rashes. They are (1) "irritants," and (2) "sensitizers." Rubber workers do not handle many "irritants" but are apt to contact many "sensitizers." Most all accelerators and antioxidants are sensitizing agents. Naphtha is the cause of the greatest number of rashes among rubber workers.

Dermatitis in users of rubber goods is rare, but may occur. Chemists should keep accurate records of all chemicals used and any new ones added to the industry. In this way, any outbreak of dermatitis can be controlled. Workers who have previously had severe athlete's foot or eczema should be carefully placed by personnel. Elderly people are prone to develop dermatitis. Housekeeping is most important and great strides have been made in this field of the industry in the last two decades, he concluded.

"Compression Distillation" is the title of a folder recently published by Arthur D. Little, Inc., Cambridge 42, Mass., which describes the principles of compression distillation and its present industrial applications.

Rubber Division Vice-Chairman

John H. Fielding

John H. "Jack" Fielding, recently-elected vice-chairman of the Division of Rubber Chemistry of the American Chemical Society, is presently associated with the Armstrong Rubber Co., West Haven, Conn., as head of the Compounding Division, Central Development Department. Mr. Fielding attended Massachusetts Institute of Technology and received a B.S. degree in chemical engineering in 1925. He received his M.S. in chemical engineering practice in 1926, also at M.I.T. He was employed with the Goodyear Tire & Rubber Co., Akron, Ohio, from 1926 until early 1949 when he joined Armstrong. During the period 1940 to 1949, he was manager of compound development. Mr. Fielding was on the Membership Committee of the Rubber Division in 1945-46, and served as chairman of that committee in 1947. In 1948, he served as a director of the Rubber Division, representing the Akron area. He has written several papers on the characteristics and use of rubber and synthetics. Mr. Fielding is a member of Alpha Chi Sigma, and has served as treasurer and on various committees of the Akron Section of ACS.

MATHEWSON ADDRESSES QUEBEC ON VINYL PLASTIC INDUSTRY

The October 20 meeting of the Quebec Rubber and Plastics Group held at the Canadian Legion Hall in Montreal, Quebec, Canada, was addressed by K. B. Mathewson, assistant sales manager of Canadian Resins and Chemicals, Ltd. Mr. Mathewson spoke on the subject "The Future Growth of the Canadian Vinyl Plastics Industry."

The speaker described the chemical make-up, properties and applications of six groups of vinyl resins. He also described polyvinyl acetate emulsion, semi-permanent starch, and the new markets which these materials have opened. Polyvinyl chloride-acetate, he said, is made in large quantities in Canada, sufficient to take care of Canadian requirements for some years to come. The operations of the fabricating plant at Shawinigan Falls were fully described. At this plant, the lay-out is such that there is a minimum of handling materials. The resins and plasticizers are made in adjoining buildings. Many new applications of the copolymers were discussed and samples of various items mentioned were shown.

Mr. Mathewson said that the difficulties of the post-war days had been largely overcome as the supply of plasticizers has increased and the quality of vinyl compounds improved. The public has overcome many of the prejudices formerly associated with vinyl fabricated goods and the manufacturers of vinyl resins in Canada can look forward to a larger and more stable market.

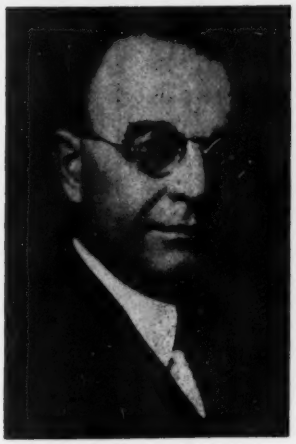
United Acquires New Interests

United Engineering and Foundry Co., Pittsburgh, Penna., has purchased the plant and assets of the Stedman Foundry and Machine Works, Aurora, Ind., and the Lobdell Co. of Wilmington, Del. The stock transfer and sale of Stedman involved approximately $1,000,000. The Stedman Foundry and Machine Works, 115-year old industry, employs approximately 200 persons. Under the reorganization of the Stedman plant, the firm name will be retained and operations continued as in the past. A new division of United Engineering, Lodbell-United Co., has taken over operations of the Lobdell plant. Lobdell-United becomes the eighth company owned outright by United Engineering. Other plants owned by the purchaser are located in Pittsburgh, Penna., New Castle and Vandergrift, Penna., and Akron, Canton and Youngstown, Ohio.

Detroit Names Committee Group

The Detroit Rubber and Plastics Group has organized the following committee to handle details at the meeting of the Rubber Division, A.C.S., to be held in Detroit on April 19-21, 1950: *General Chairman*, G. M. Wolf; *Banquet*, John Dudley; *Registration*, G. F. Lindner; *Finance*, G. R. Cuthbertson; *Meeting Rooms*, W. Davies; *25-Year Club*, E. J. Kvet; *Plant Trips*, R. J. Shroyer.

Russ Retires From U. S. Rubber



Charles A. Russ

Charles A. Russ, manager of the Printing Materials and Special Products Department of the Mechanical Goods Division of the U. S. Rubber Co., has retired from the company after more than 40 years of service. Leslie Ackerman, assistant manager of the Printing Materials and Special Products Department, has been named to succeed him. Mr. Russ joined U. S. Rubber in 1906 as a clerk and salesman for the Enterprise Rubber Co., now a part of U. S. Rubber. He served in various sales and development capacities until 1930 when he was named manager of new product development for the Mechanical Goods Division. In 1933 he was made sales manager of tank lining and printing specialties and in 1945 headed the division's Printing Materials and Special Products Department. He is a graduate of Dartmouth College. Mr. Ackerman joined the company in 1942 as a chemist at its Providence, R. I., plant shortly after receiving his M. S. degree in chemistry from Rensselaer Polytechnic Institute. He was named assistant manager of printing materials and special products in March of this year.

Develops Rubber Tractor Springs

U. S. Rubber Co., New York 20, N. Y., has developed rubber springs which operate on a torsional shear principle, taking the "jerks" and "bumps" out of riding a tractor. They consist of a thick layer of especially compounded rubber sandwiched between two metal plates. The rubber is fastened to the metal by a special brass plating process. As the tractor rides over rough ground, the rubber twists and turns with each bump and jolt, cushioning the initial shock and leveling out the sharp rebound which normally occurs with the use of a heavy steel spring. The springs can be adjusted for various weights according to the driver's size. New tractor seats being manufactured by the Bostrom Manufacturing Co. of Milwaukee, Wisc., utilize the new rubber springs.

Akron Still Tire Capital

According to the Commerce Department, Ohio continues as the outstanding leader among the states in tire manufacture. The 11 tire factories in Akron include the largest in the nation, and although they represented but 19.3% of the 57 establishments in the 1947 industry they employed 41.6% of the wage earners, paid 39.5% of the wages and 31.6% of the cost of materials, and shipped 33.2% of the products of the industry. Through control of tire factories in other states, companies in the Akron district hold a much more dominant position than indicated by Census statistics for Ohio. In the year ended June 30, 1948, Akron tire companies paid 61.6% of the $159,284,000 federal excise taxes on tires and tubes.

Dedicate New Wire Plant

Dedication ceremonies in connection with the new $3,500,000 plant of the Electric Auto-Lite Co. were held in Hazleton, Penna., on October 18. The new plant, headed by Paul W. Becker as factory manager, is expected to pour a minimum annual payroll of $750,000 into Hazleton. There is quite a story behind the opening of the new plant.

When the war ended the city had an unemployment roll of over 4,000. Local business men organized a special committee and went seeking new industries. The committee promised the Auto-Lite company a half-million dollars to build a plant in Hazleton.

At the time the offer was made the committee had no funds, but when it returned to Hazleton and told its story contributions poured in from the local residents at an amazing rate, in amounts from 50 cents to $20,000. Some $659,000 was raised in three weeks. In addition, the Hazleton Industrial Development Corporation, a non-profit agency, took bank loans totaling $700,000 which were applied to the cost of the plant.

The company agreed to pay $90,000 a year to Hazleton for a period of ten years, after which the plant would revert to the company. Auto-Lite invested an additional $2,300,000 to complete and equip the plant. Composed of three buildings, the plant has approximately 180,000 square feet of floor space to be devoted to the manufacture of automotive and industrial wire and cable.

Form New Manufacturing Concern

The Rubber Engineering & Chemical Co. was recently organized at Lake Zurich, Ill., for the manufacture of rubber cutting pads and blocks as well as a general line of molded goods. A. F. Stevens is general manager of the new company which is compounding and processing its own rubber.

Named to Australian Plant

L. D. Hochberg

L. D. Hochberg, director of training for the Goodyear Tire & Rubber Co. since August, 1948, has been appointed superintendent of the company's plant at Granville, Australia. Born on December 26, 1901, Mr. Hochberg first joined the company in 1919 as a production worker, but left the following year to join the Marine Corps. He returned to Goodyear as a member of the company's training program and in 1929 was made foreman of the squadron. During his lengthy service with the company he has been in charge of squadron training at the company's plant in Buenos Aires, Argentina, and acted as superintendent of the plant in Java, Indonesia. For two years he also served as superintendent of the Goodyear Fabric Corporation at New Bedford, Mass.

Phillips Hydrocarbon Mixtures

The Chemical Products Department of the Phillips Petroleum Co., Bartlesville, Okla., has made available a new series of hydrocarbon mixtures of known composition designed for standardizing equipment, for checking the calibration of infrared, ultraviolet and mass spectrometers and low-temperature fractionation equipment, and for testing the accuracy of analysts. The six mixtures are numbered 31 through 36. Exact blending compositions, accurate to ± 0.05 weight per cent, are furnished with each order. The mixtures are shipped in one-quart steel cylinders.

Sonneborn Relocates Offices

L. Sonneborn Sons, Inc., has announced the removal of its executive and general offices to 300 Fourth Avenue, New York 10, N. Y. The White Oil and Petroleum Division, the Amalie Motor Oil Division, the Textile Chemicals Division, and the Export Division are now located in the new offices. The Building and Products Division remains at 80 Eighth Avenue, New York 11, N. Y.

PACIFIC CHEMICAL EXPOSITION SPONSORS CONFERENCE ON RUBBER

In a program sponsored by the Northern California Rubber Group and the San Francisco Section of the Society of the Plastics Industry, nine papers and a panel discussion were presented as part of the Industrial Conferences at the Pacific Chemical Exposition held at the Civic Auditorium in San Francisco, Calif., on November 4. Six of the papers presented dealt with rubber problems, while the remaining three were on plastics.

The highlight of the evening was a banquet attended by members of both sponsoring groups. The principal speaker at the banquet was Leonard K. Firestone, president of the Firestone Tire & Rubber Co. of California, who delivered an address entitled "The New Day in Rubber." A panel discussion which climaxed the day's conference was led by Dr. Raymond B. Stringfield, president of the Fullerton Manufacturing Co., Fullerton, Calif.

H. J. Jordan (DuPont), organizer of the program on rubber and plastics, keynoted the session with an introductory talk in which he stated that for the first time in that area a joint meeting of rubber and plastics groups had been accomplished. He explained that the purpose of the meeting was to promote understanding between manufacturers of rubber and plastics products and the consuming industries as to each other's problems.

Engineering Rubber Products

The principal emphasis of a paper on "Engineering of Rubber Products for Industrial Needs," by W. D. Good of the American Rubber Manufacturing Co., Oakland 8, Calif., was on ways in which rubber technologists can help the consumer in the proper engineering of rubber products for his industrial needs. It was recommended that a cooperative attitude be established between the consumer's engineering department and the rubber technologist. The properties desired in the rubber item should be determined and listed in the order of their importance. The rubber technologist should be supplied with a complete description of the service application, and he should perform laboratory tests and service trials to establish the suitability of the item.

It was stated that if the ultimate in any one property was desired, the consumer should be prepared to accept some compromise in the quality of the other properties of the rubber item. Mr. Good emphasized the fact that American-made synthetic rubbers offer many unusual advantages not found in natural rubber and he reviewed the various properties which may be obtained in rubber items. The speaker concluded his paper by reviewing many of the successful engineering applications of rubber, citing examples of the service which had been achieved.

Griffith F. Oliver, president of the Oliver Tire & Rubber Co., Oakland 8, Calif., in a paper on "Tire Recapping Materials," stated that in 1949 about 20% of the replacement tires sold will be recaps. Since the average tire uses about 3 to 5 pounds of recapping materials, this means that 20,000,000 pounds of recapping materials will be sold during 1949. Mr. Oliver discussed the different types of camelback and applicable government restrictions in their manufacture.

The recipe for camelback normally contains about 60% rubber, 30% carbon black with the remaining 10% consisting of softeners and curing ingredients, the speaker said. Camelback made from "cold rubber" usually is more expensive, but the cost is more than offset by the increased quality. Mr. Oliver also listed a number of points to be considered upon choosing a recapper which included reliability, the type of materials used and why, and the thickness of the rubber the recapper uses for his operation.

Rubber Business Outlook

The western outlook for business is good, said F. E. Schluter, president of the Thermoid Co., Trenton 6, N. J., in an address on "The Outlook for the Rubber Business in the Inter-mountain and Pacific Areas." Mr. Schluter stated that the trend towards decentralization of business, the higher per capita buying power of westerners with respect to the rest of the nation, the better attitude of labor towards management in the west, and the progressive attitude of the westerners all favor better business conditions. The speaker stated that if the national outlook were better, the western outlook would be limitless.

In a paper on "Applications of Neoprene and Cold Rubber in Electrical Cable," Gene Huxley of Western Insulated Wire, Inc., Los Angeles 1, Calif., stated that "cold rubber" had been found to be ideally suited for wire insulation because high tensile strength can be obtained from its compounds and that properly compounded stocks can take a partial cure without blowing.

The principal causes of failure of electrical cable were attributed to the failure of the copper conductor due to either flex cracking or abrasion, and failure of the jacket due to abrasion, sunlight, or chemical attack. Neoprene jacket compounds were found to give the best all-around protection to the cable. Its excellent resistance to sunlight, oils, aging, its flame resistance and resistance to cutting, chipping, abrasion and tearing have led to it being used more than either GR-S or natural rubber in cable jackets.

Cold Rubber Compounding

The tensile strength of "cold rubber" is about equal to that of natural rubber but at high temperatures its ultimate elongation is inferior, said Dickson M. Sheppard, chief chemist of the Firestone Tire & Rubber Co., Los Angeles, Calif., in a talk on "Cold Rubber Compounding and Processing." The flex life of both "cold rubber" and GR-S are inferior to natural rubber, but "cold rubber" is better in this respect. "Cold rubber" is not as good as natural rubber for resilience and heat build-up, he said.

Leonard K. Firestone

Delivers keynote address at Industrial Conference on Rubber

On the basis of equivalent loading, the roadwear of "cold rubber" compounds is 23% better than GR-S compounds and about 15% better than natural rubber compounds. Tread cracking characteristics of "cold rubber" are better than GR-S, but are inferior to natural rubber. "Cold rubber" is inferior to both GR-S and natural rubber for sidewall cracking, and is no better than GR-S for skid resistance on icy roads.

The processing of "cold rubber" does not appear to present too much of a problem, Mr. Sheppard said. Shorter mixing times are possible but scorch problems are somewhat greater especially with camelback acceleration. "Cold rubber's" future use, according to the speaker, seems largely confined to treads of the smaller sizes of passenger tires and to camelback.

G. A. Fowles, sales manager of plastic materials for the B. F. Goodrich Chemical Co., Cleveland, Ohio, in a paper on "Vinyl Plastics Invade the Rubber Field," predicted the sale of 200,000,000 pounds of vinyl plastics this year. The sale of vinyl in this amount will tend to replace many of the fields formerly occupied by rubber. The principal features of the vinyl plastics which add to their bid for use over rubber are flame resistance, toughness, easy processability, and chemical resistance.

The ease of processing of the vinyl plastics lessens to a large extent their high material cost and thus places them in a competitive position for many rubber applications, he said. In concluding his talk, Mr. Fowles showed slides

and a short movie which presented examples of vinyl plastics which had replaced rubber. Examples shown included garden hose, plastic films, upholstery, insulated wire, dolls, gasketing, athletic goods, floor tiling, phonograph records, etc.

Application of Plastics

The many new plastics materials which have been developed in recent years have created special problems in the plastics industry, said Ferdinand T. Kebely, manager of the K-Plastix Co., San Francisco, Calif., in a paper on "Plastics: Industrial Applications." Thermosetting and thermoplastic plastics each dictate their own method of processing. Mr. Kebely remarked that plastics in combination with other materials sometimes have better physical properties than plastics alone.

In a talk on "A Plastic Business," H. Norman Eierman, industrial sales manager of the Remler Co., San Francisco, Calif., stated that only large volume production of a plastic item appears to be profitable. The reason for this is the large tooling cost required for each new item. This, in turn, requires a large volume of return in order to amortize the cost reasonably. After the marketability of the item is assured, he said, the manufacture of a production die which may cost several thousands of dollars is justified.

Firestone Addresses Banquet

At the dinner meeting following the panel discussion, Leonard K. Firestone traced the history of synthetic rubber from the time of the early German developments to the present. The speaker predicted that the use of synthetic rubbers will increase. At the present time, he said, 40% of all new rubber consumed is synthetic. The foreign market for American-made synthetic rubber is restricted by a dollar shortage abroad. Also, the competitive position of natural rubber has been improved by the devaluations of foreign currencies. However, this country has attained national self-sufficiency through its synthetic rubber program, and the price of rubber has been stabilized, he stated.

Aging Effect on Hycar OR-15

A long aging period has little effect on crude Hycar OR-15, according to a report from the B. F. Goodrich Chemical Co., Cleveland 15, Ohio. Tests conducted in laboratories of the company with samples of this rubber manufactured nearly five years ago are reported to indicate that little or no property change had occurred in that period either in the crude or vulcanizate forms. Although slightly darker in color than current Hycar OR-15, which is attributed to antioxidant discoloration, the five year old sample handled and milled identically the same as the current product, showing no variation due to age. Data on the recipes used and specific text results can be secured from the company on request.

Oakleaf Named Sales Manager

Amos Oakleaf

Amos W. Oakleaf, associated with the Phillips Petroleum Co., Bartlesville, Okla., since 1944, has been appointed sales manager in charge of foreign and domestic sales of furnace blacks, Philblack A and O, for the Phillips Chemical Co., the petroleum company's subsidiary. Mr. Oakleaf will continue to make his headquarters at the Phillips Chemical sales offices in Akron, Ohio. He is a graduate of the University of Kansas with a bachelor of arts degree in chemistry. At the same time, Raymond J. Hull was appointed manager of Philblack export sales with headquarters in New York, while George E. Popp was named manager of domestic and Canadian sales of Philblack with headquarters in Akron. Mr. Hull graduated from Purdue University in 1927 with a degree in chemical engineering. He was manager of a tire and tube plant in Holland before joining Phillips. Mr. Popp held important positions in the tire industry before his association with Phillips in 1945.

Auction Kroma Chemical Assets

Pursuant to an order of the United States District Court, the plant and assets of the Kroma Chemical Co., Inc., Raritan, N. J., were offered in a bankruptcy sale on November 7 at the plant site. Among the machinery and equipment offered for sale were mixers and motors, blenders, ribbon blenders, attritors, laboratory equipment, parts and many other items. Also offered for sale were chemicals and pigments including castor oil, lithol, calcium carbonate, colors, zinc oxides, etc.

Paranite Purchases Cords Plant

As a result of an over-all bid, the Paranite Wire and Cable Division of the Essex Wire Corporation is understood to have acquired the plant and assets of Cords, Ltd., in Newark, N. J., at the bankruptcy sale held at the premises on October 7. It is reported that the price, including real estate, was in the neighborhood of $350,000.

Dedicate New Harwick Plant

The official opening of the new plant and general offices of the Harwick Standard Chemical Co. at 60 South Seiberling Street in Akron, Ohio, was marked by appropriate ceremonies on October 22. More than 1,000 guests from representative manufacturing concerns in Akron and other parts of the country were in attendance. The new plant provides 50,000 square feet of space on two floors. Manufacturing is centered in one section fronting on Seiberling Street while extensive warehousing space adjoins this section to the rear of the building. General offices are centered at the Englewood Avenue end of the building, which faces an intervening park. A unique decorating plan was followed to a create a warm, friendly atmosphere for visitors and a homelike atmosphere for employees. A completely equipped kitchenette is included for the convenience of the employees. The Harwick Standard Chemical Co. was founded in 1932 by the late Curtis J. Harwick. Since his death in July, 1948, the organization has continued under the leadership of J. R. "Jack" Moore, a long time associate and now president of the company. Closely linked with the final development of the new plant and general offices was Virginia L. Harwick, Mr. Harwick's widow, who serves as chairman of the board and treasurer of the company.

McLane Organizes Pilgrim Pottery

John T. McLane, president of the Sun Rubber Co., Barberton, Ohio, has organized Pilgrim Pottery at Fredericksburg, Ohio. The new firm has taken over the plant of the Fredericksburg Art Co., of which Mr. McLane was president. Fredericksburg Art was organized in 1939. Pilgrim Pottery is headed by George A. Stanford, Jr., with Mr. McLane as vice-president. C. V. Martin, formerly plant superintendent of Sun Rubber during the war years is treasurer and general manager of Pilgrim Pottery. Mr. Martin resigned his position with Sun Rubber in 1946 to become vice-president and general manager of Fredericksburg Art. Adrian W. Miller, former secretary of the Fredericksburg company, is secretary of the new firm.

Carbide and Carbon Dynel Fiber

Carbide and Carbon Chemicals Corp., New York 17, N. Y., has announced the development of "Dynel," an acrylonitrile-vinyl chloride staple fiber. Among the advantages claimed for the product are high resilience, loft, warmth, strength, fire resistance, moth-proofness, and fungus inertness. Fabrics made of the new staple fiber will not support combustion, are light in weight, and dry-clean without shrinkage. At present, Dynel is available in development quantities. However, Carbide has started to provide for a substantial increase in production capacity at its present South Charleston, W. Va., plant. These commercial facilities are expected to be in operation sometime in the second quarter of 1950.

NAMES IN THE NEWS

DAVID NEILL, associated with the Farrel-Birmingham Co., Inc., since 1942, has been named Cincinnati sales representative for gears, gear units and flexible couplings manufactured in the company's Buffalo, N. Y., plant.

DR. CHARLES ALLEN THOMAS, executive vice-president of the Monsanto Chemical Co., St. Louis 4, Mo., has been elected chairman of the company's five-man Executive Committee.

ABBOTT K. HAMILTON, associated with the Pennsylvania Alcohol and Chemical Corp. as vice-president and general manager when that company was purchased by Commercial Solvents Corp. in 1947, has been elected vice-president of the parent company.

JOHN L. COLLYER, president of the B. F. Goodrich Co., has been named to the Munitions Board Advisory Committee on Military-Contractor Relations of the Office of the Secretary of Defense. He was also recently elected a trustee of the Alfred P. Sloan Foundation.

CARL M. PATTERSON, associated with the textile industry for many years, has been appointed a sales representative for the Lastex Yarn and Rubber Thread Division of the U. S. Rubber Co., with headquarters in Chicago, Ill.

T. W. PRIOR, manager of squadrons for the Goodyear Tire & Rubber Co. at Akron since 1949, has been named director of training, succeeding L. D. Hochberg who has been appointed superintendent of the Goodyear plant at Granville, Australia.

GERARD KUCKRO, production manager of Molded Latex Products, Inc., for the past few years, and previously associated with the insulated wire industry, has joined the staff of the General Electric Co. at Bridgeport, Conn.

AUSTIN A. BALLOU, formerly director of personnel, wage administrator, auditor and office manager of the American Hard Rubber Co., has joined the staff of Lorton McKay, business personnel agency of New York City.

RUSSELL D. PORCH, treasurer of the Denman Rubber Manufacturing Co., Warren, Ohio, has been appointed to the Civil Service Commission of the city of Mansfield, Ohio.

WILLIAM O'NEIL, president of the General Tire & Rubber Co., Akron, Ohio, has been named chairman of the board of the National Council for Community Improvement.

GARVIN A. DREW, general sales manager of A. Schrader's Son, Brooklyn 17, N. Y., has been elected president of the New York Sales Manager's Club.

CHARLES A. WALMSLEY, associated with the Cameron Machine Co., Brooklyn 2, N. Y., as assistant to the president since last June, has been named vice-president in charge of production for the company.

FRED A. SAWYER, associated with the U. S. Rubber Co. since 1939, has been appointed manager of automotive sales for the Footwear and General Products Division of the company.

HARVEY S. FIRESTONE, JR., chairman of the board of the Firestone Tire & Rubber Co., has been awarded a distinguished service citation by the Automobile Old Timers' Club in recognition of his services to automotive development.

MILFORD J. BROWN, associated with the Cooper Tire & Rubber Co., Findlay, Ohio, since 1946, and at one time process engineer for the General Tire & Rubber Co., has been promoted to manager of the mill and calendering departments of Cooper Tire.

C. LAWRENCE MUENCH, president of the Hood Rubber Co., Watertown, Mass., has been elected to serve a two-year term as president of the Associated Industries of Massachusetts.

FRANKLIN G. SMITH, president of the Ohio Rubber Co., Willoughby, Ohio, celebrated his 82nd birthday recently at a Denison University reunion dinner held in Cleveland, Ohio.

DR. RICHARD S. GEORGE, formerly manager of the Naval Stores Research Division of the Hercules Powder Co., Wilmington, Del., has been appointed assistant director of the Experiment Station with headquarters at Wilmington.

KERMIT R. SADLER, since 1943 manager of traffic and warehousing at the Los Angeles, Calif., plant of the B. F. Goodrich Co., has been appointed general traffic manager of the company with headquarters at Akron.

OLLIE MIDDLEBROOKS, formerly superintendent of the Sunray, Texas, plant of the Continental Carbon Co., has been appointed superintendent of that plant as well as of the Eunice, New Mexico, plant of the Witco Carbon Co.

E. H. "TED" BROOKS, director of purchases for the Goodyear Tire & Rubber Co., was recently presented a pin by the company in recognition of 40 years' of service with the firm.

FRANK B. POWERS, formerly assistant vice-president in charge of production for the American Car and Foundry Co., has been appointed director of manufacturing operations of the Federal Telephone and Radio Corp., Newark, N. J.

New Pennsylvania Personnel

The recent consolidation of the tire and tube production of the Pennsylvania Rubber Co. with that of the Mansfield Tire & Rubber Co. at Mansfield, Ohio, has been followed with an announcement of personnel assigned to sales and other exceutive positions of Pennsylvania Rubber. E. V. Duffy has been named sales manager; R. L. Baumgardner, advertising and sales promotion manager; A. P. Weightman, office manager; N. W. Graham, manager of stock regulation, and H. B. Carpenter, manager of original equipment and government sales. All of these men have been with Pennsylvania Rubber for a number of years and will maintain headquarters at Mansfield.

HARRY L. FISHER, director of organic research, U. S. Industrial Chemicals, Inc., Baltimore, Md., has been elected to honorary membership in the American Institute of Chemists.

WARREN L. TOWLE, associated with the Columbia Chemical Division of Pittsburgh Plate Glass Co., is on a temporary leave of absence from that company and is teaching industrial chemistry at M.I.T. in Cambridge, Mass.

R. A. V. RAFF, associated with the Howard Smith Paper Mills, Ltd., Cornwall, Ont., Canada, known for his work on lignosulfonates, has been awarded a Koppers Co. fellowship at Mellon Institute, Pittsburgh, Penna.

F. W. STEERE, JR., formerly in charge of plasticizer sales for the B. F. Goodrich Chemical Co., has formed a new company in Akron, Ohio, for the processing of vinyl resins and compounds.

SIDNEY J. PIKE, JR., formerly vice-president of T. A. Desmond & Co., New York 6, N. Y., has resigned his position with that company.

FRED DENIG, vice-president and formerly manager of the research department of Koppers Co., Inc., has been made manager of the company's production department. DR. G. FRANK D'ALELIO, who joined the company in August, 1947, as an assistant manager of the research department, has been named vice-president and manager of that department.

G. FRED RIEMAN has been appointed director of sales of the Ball Brothers Company, Muncie, Ind., and PHILIP W. HATCH has been named sales manager of the commercial products division.

FRED H. HAGGERSON, president of the Union Carbide and Carbon Corp., New York, was recently awarded the 1949 Medal for the Advancement of Research by the American Society for Metals.

W. E. HOLLAND, formerly with the Electro Technical Products Division of the Sun Chemical Corp., has joined the Behr-Manning Corp., Troy, N. Y., as development manager in the new product division.

Heads Chemical Laboratories

Dr. John N. Street

Appointment of Dr. John N. Street to the position of director of chemical laboratories has been announced by the Firestone Tire & Rubber Co., Akron, Ohio. Prior to World War II, Dr. Street was in charge of Firestone's synthetic rubber development program. During the war years, he served as official company representative on the Government's Synthetic Rubber Technical Committee, which later became the Research and Development Group. In 1945, Dr. Street was one of the industry representatives sent to Europe by Rubber Reserve to investigate German research and development programs for synthetic rubber. The discoveries of this committee are said to have led to the practical development in this country of cold rubber in 1945 and 1946 while Dr. Street was manager of research and development of the Office of Rubber Reserve.

Dr. Street joined the Firestone organization as a research chemist in 1926. Previously, he had studied at Cornell and Iowa Universities and had received his AB degree from Syracuse University in 1921, his MS degree from Syracuse in 1923, and his doctor's degree in chemistry from the University of Wisconsin in 1926. In 1936, he became director of chemical and physical research at Firestone and in 1944 was named assistant director of chemical laboratories. Dr. Street succeeds Dr. E. B. Babcock, who is retiring from active administrative work as director of laboratories at Firestone after 33 years of service with the company. Dr. Babcock will continue, however, as technical consultant on a series of special projects for the company.

Goodyear "Alarm" Mine Hose

A new water hose, primarily for use in coal mines for wetting down dangerous dust, has been developed by the B. F. Goodrich Co., Akron, Ohio. The new addition to the company's line is named "Alarm." To make the hose easily seen in mines, it is being made with an orange color which is easily visible in the dark. The hose is made only in ¾-inch size with 1-3/16-inch outside diameter.

Engineering Staff Changes

Several changes have been made in the executive staff of the Engineering Division of the B. F. Goodrich Co., following the assignment of H. E. Cook, chief engineer for many years, to major engineering problems. Frank Brown has been appointed plant engineer of all Akron plants while George Murphy has been named plant engineer of Plant 4, reporting to Mr. Brown. Clifford R. Augden has been named superintendent of shops, also reporting to Mr. Brown. Mr. Brown, a graduate in engineering from the University of Michigan, has been with the company since 1927, starting as a power engineer. Among other posts he has held was technical superintendent of the Metal Products Division. He goes to his new job after serving as superintendent of shops. Mr. Murphy, who took engineering studies at Carnegie Tech and John Huntington Polytechnic Institute, began as a factory employee in 1933. He has been a construction engineer, and had been a general foreman of engineering for three years before his present assignment. Mr. Augden, who succeeds Mr. Brown as superintendent of shops, received his bachelor's degree in metallurgical engineering at the Case School in Cleveland and his master's degree from Ohio State. He has been with the company for 16 years, serving as metallurgist and metal shops general foreman.

Plant Maintenance Show Planned

Many subjects of interest to the rubber industry will be on the program for discussion at the first Plant Maintenance Show, which will be held in the Auditorium, Cleveland, Ohio, January 16 to 19, 1950. The four-day exposition, which will be held concurrently with a four-day conference, is the first ever devoted exclusively to maintenance. The program will be sponsored jointly by the American Society of Mechanical Engineers and the Society for the Advancement of Management. The Cleveland Engineering Society will be hosts at a dinner for visitors. L. C. Morrow, editor of *Factory Management and Maintenance*, will be general chairman of the conference. More than 100 exhibitors will give demonstrations of machinery, materials and methods for reduction of costs in plant maintenance.

Shell Opens Service Laboratory

The opening of a new technical service laboratory at Union, N.J., has been announced by the Shell Chemical Corp. The new laboratory is under the direction of Dr. Donald S. Herr, who previously directed the company's technical service laboratory at Martinez, Calif. The new Shell laboratory is equipped with extensive modern facilities for the examination and evaluation of petroleum-derived chemicals in their many industrial uses. Special emphasis, however, will be placed on the surface coating uses of these chemicals, particularly as they apply to use in lacquers and synthetic enamels. Investigations will also be conducted on customer problems involving the use of the company's products.

Heads New Kessler Affiliate

Maurice J. O'Connor

Kessler Chemical Co., Inc., has announced the formation of a sales affiliate, the Kessco Chemicals Corp., which will handle sales and distribution of their entire line of products. Maurice J. O'Connor has been appointed sales manager of the new firm with headquarters at the plant of the parent company at State Road and Cottman Avenue, Philadelphia 35, Penna. In announcing the change, Kessler company officials stated the step was in line with company plans for improving technical service to the customer. It was anounced at the same time that the technical service laboratory of the company is being expanded to meet the increasing needs of industries using Kessco products. Kessco has opened a mid-western sales office at 333 N. Michigan Avenue, Chicago 1, Ill., with Stanley F. Choate in charge. Kessco Chemicals Corp. will continue to be represented in the New York area by W. W. Angus, Inc., 220 Broadway, New York 7, N. Y., and in New England by M. F. Robie & Sons, So. Braintree 85, Mass.

Minnesota Mining Appointments

A new post for one of its vice-presidents and added responsibilities for two others have been announced by the Minnesota Mining and Manufacturing Co., St. Paul 6, Minn. Lloyd A. Hatch, vice-president formerly in charge of the firm's Roofing Granule Division, has been assigned the job of coordinating research and new product development. The other officers are Clarence B. Sampair, vice-president in charge of production, who is now also in charge of labor relations, and C. P. Pesek, vice-president in charge of engineering, in charge of all company property. All three men fill "staff posts", reporting directly to the president. Mr. Hatch joined the company in 1923 as a chemist and was elected a vice-president in 1946. Mr. Sampair joined the company in 1927, was named production manager in 1940 and elected a vice-president in 1946. Mr. Pesek has been with Minnesota Mining for six years, and has been a vice-president since 1947.

Colbeth Named Baker President

I. Milton Colbeth

I. Milton Colbeth, associated with the Baker Castor Oil Co., 120 Broadway, New York, N. Y., for more than 30 years, was recently elected president of the company. Mr. Colbeth joined Baker in 1920 after a period of military service as a physical chemist in the U. S. Chemical Warfare service, and a short time with Procter and Gamble as superintendent of their vegetable oil refinery in Staten Island, N. Y. After setting up a control system for Baker, Mr. Colbeth's time was devoted chiefly to original research in castor oil processing, its derivatives and applications. This work led to the issuance of several important groups of patents. In 1929 Mr. Cobeth was appointed chief chemist in charge of organic research and process design; in 1931 he became chemical director with supervision over all research, plant expansion, sales service and other technical activities of the company, and in 1948 he was elected vice-president of the Operating Division in complete charge of all technical and manufacturing operations. Mr. Colbeth received his B. S. degree from the College of the City of New York. He is a member of the Association of Research Directors, Electro Chemical Society, American Society for Testing Materials, American Chemical Society, Chemists Club and a fellow of the American Institute of Chemists.

Goodrich Weed Spray Hose

A special weed spray hose, designed and constructed to resist the highly aromatic carriers which are particularly destructive to rubber, has been developed by the B. F. Goodrich Co., Akron, Ohio. The hose, in addition to being efficient for weed spraying, is said to be satisfactory for fungicidal and insecticide types of sprays, which usually have oil or aromatic carriers. The hose is of the braided type, in black, with a molded cover and working pressure of 200 pounds per square inch. The 3/8-inch size has an outside diameter of 11/16-inch, and the 1/2-inch size has an outside diameter of 7/8-inch.

Dasher Rubber & Chemical Co.

Dasher Rubber & Chemical Co., a newly incorporated firm with headquarters in Fairport, Ohio, has been formed for the chemical processing and manufacture of cellulose by-products, and the processing of quality rubber compounds. The firm expects to begin full scale operations in six to eight months in the warehouse and other buildings of the Pennsylvania and Lake Erie Dock Co., which have been leased for that purpose. Three other buildings in Fairport have also been purchased by Dasher Rubber, to provide 16,000 square feet of working space for the company. The layout of the plant will cost an estimated $250,000, most of which will be spent for automatic machinery. The plant will employ about 25 people. P. J. Dasher, formerly associated with the B. F. Goodrich Co., is president of the new company. He is also president of the Summit Industrial Products Co. of Akron. Other company officers include R. J. Dorn, president of Barr Rubber Products Co., Sandusky, Ohio, vice-president, and George Kendrick, president of the Clariden Corp., Cleveland, Ohio, treasurer.

Sargent Completes New Plant

Completion of a new plant and office building at 4647 West Foster Avenue, Chicago 30, Ill., has been announced by E. H. Sargent & Co., manufacturers and distributors of scientific laboratory instruments, apparatus and chemicals. The one-story steel, concrete and brick building occupies approximately three acres of a five acre tract of company-owned land in Chicago. The plant houses complete engineering, merchandise handling and warehouse facilities, instrument factory, physical and chemical laboratories, offices, cafeteria, etc. Shipping facilities include a rail loading dock, rail spur and two inside motor truck docks.

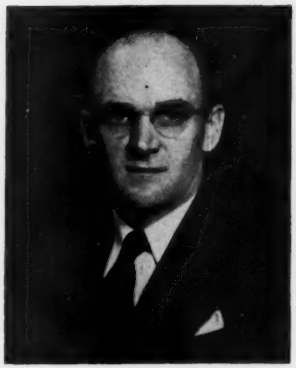
Issue ASME Mechanical Catalog

The American Society of Mechanical Engineers, 29 West 39th St., New York, N. Y., has published the 1950 edition of the A.S.M.E. Mechanical Catalog and Directory. Representing the 39th annual edition, it consists of 300 pages and contains 6500 headings, 4600 manufacturers, and 48,500 individual listings. Descriptions of hundreds of items used by industry are contained in the catalog section, with all catalogs arranged in alphabetical order. An alphabetical list of trade names is included as is a comprehensive catalog of 20 pages supplying information about A.S.M.E. codes, standards, periodicals, etc.

Sponsors Research Institute

International Latex Corp., Dover, Del., is sponsoring a medical research program for the purpose of studying seven infants' and children's diseases and disorders. The non-profit organization will be called the Playtex Park Research Institute. It will concentrate on infant cancer, child psychiatry, cerebral palsy, premature birth, allergy, epilepsy and rheumatic fever.

Walker Joins General Latex



Donald F. Walker

Donald F. Walker, formerly associated with the Dunlop Tire & Rubber Goods Co., Toronto, Ont., Canada, has joined the laboratory staff of the General Latex & Chemical Corp., Cambridge 39, Mass., to head the Foam Rubber Development Group. Mr. Walker is a graduate of the University of Toronto with a degree in chemical engineering. He became associated with the Dunlop Rubber organization in 1935. Since 1937 he has been actively engaged in foam latex work, both in factory control and development of foamed latex processes. During the war years, he brought to production stages certain essential military developments in rubber latex. He also brought synthetic latex into successful use in foam sponge applications. After the war, Mr. Walker was put in charge of all operations in the manufacture of foam sponge, including production, product design, factory control and development programs. He is a member of the Canadian Institute of Chemistry and a past chairman of the Ontario Rubber Section of the C.I.C.

Pakistan Seeking Rubber Plant

Officials of the Government of Pakistan are in the United States in an attempt to interest a rubber company in opening a Pakistan branch. Special inducements have been offered for a plant capable of producing 700 tires per day. The Pakistan Government would remit all taxes for five years up to 5% of profits. Also, a liberal depreciation rate for equipment would be set amounting to 20% the first year and 15% the second. Profits will be allowed to leave the country in which the investment was made. The rubber plant would be set up in Karachi, the capital, where there are already auto and truck assembly plants and projects for two more. The proposed rubber company would most likely dominate the field in a country of 366,000 square miles and 82,000,000 people. Most of the tires in use in Pakistan today are of British manufacture. At this writing, Pakistan officials had already contacted five rubber firms in the Akron area. All showed considerable interest, although plans were still in the preliminary stage.

Hot Tips on Cold Rubber:

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MANUFACTURER DISTRIBUTOR

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AN IDEAL BALANCE
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COLUMBIAN CARBON CO. MANUFACTURER

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OHIO RUBBER REORGANIZATION IS COMPLETED AT WILLOUGHBY

The new board of directors of the Ohio Rubber Company (Delaware) met recently at Willoughby, Ohio, and re-elected all former officers. The company, formerly known as the Ohio Rubber Company of Ohio, was sold for approximately $6,000,000 in order to clear up the estate of the late A. C. Ernst. The present management group purchased a substantial amount of the securities of the new company. It was announced that there will be no changes in the business or policies of the company.

At the meeting, the following officers were re-elected: *President,* Franklin G. Smith; *Executive Vice-President,* General Hermon F. Safford; *Vice-President in Charge of Automotive Sales,* C. J. Edwards; *Vice-President in Charge of Manufacturing,* R. A. Mertz; *Secretary,* C. K. Arter; *Treasurer and Controller,* H. J. Bechtold; *Assistant Treasurer,* A. B. Bourquard; *Assistant Controller,* S. A. Edgell; *Assistant Secretary,* J. H. Winchester; *Assistant Treasurer,* L. E. Budnick.

The new board of directors consists of Howard B. Brown, Pitcairn Co., Philadelphia, Penna.; James E. McMullen, Payson & Trask, New York, N. Y.; General Hermon F. Safford; Charles Saltzman, New York, N. Y.; Franklin G. Smith; Robert B. Smith, Smith, Moore & Co., St. Louis, Mo., and Frederick K. Trask, Jr., Payson & Trask, New York, N. Y.

Ohio Rubber has three plants. The home plant at Willoughby, Ohio, covers approximately 600,000 square feet of floor space. It employs between 1,400 and 1,500 persons. Two other plants at Long Beach, Calif., and Conneautville, Penna., have approximately 100,000 square feet of floor space each. Each plant employs between 100 and 200 persons.

Abbe Purchases Kent Mill Co.

Abbe Engineering Co., 50 Church Street, New York 7, N. Y., has acquired the plant, equipment, designs and good will of the Kent Mill Co., Inc., Brooklyn, N. Y. Henceforth, the Kent Mill Division of the Abbe Engineering Co. will take over all the activities of the former company. All correspondence with regard to new equipment, repair parts and accessories should be addressed to the new division at 50 Church Street, New York 7, N. Y. An extensive development program is already underway for the improvement of Kent-Maxecon mills, along the lines of better economy of operation and materially increased capacity. Announcement of a new Kent-Maxecon mill will be made by Abbe Engineering in the near future.

Goodrich Denies FTC Charges

B. F. Goodrich Co. has denied Government charges of price discriminations in the sale of rubber and canvas footwear. The denial came in answer to a Federal Trade Commission charge that Goodrich granted certain buyers larger discounts than allowed other purchasers.

Smith Named Baker President

Marion W. Smith

Marion W. Smith has been elected president and general manager of the J. T. Baker Chemical Co., Phillipsburg, N.J., succeeding Herbert H. Garis, who continues as a member of the board of directors. Mr. Smith, a vice-president and director of the Vick Chemical Co., participated in the acquisition of Baker by Vick in 1941 and in recent years has been a director of Baker and active in the management of its formulation policies. At the preceding stockholders meeting, the following new directors were elected to the Baker board. Dr. Joseph R. Stevens, technical director; Robert R. Wittenberg, and Leslie W. Garner, treasurer and comptroller.

Chemical Industries Exposition

The 22nd Exposition of Chemical Industries will be held at Grand Central Palace, New York, N.Y., on November 28 to December 3. The exhibits will include a great variety of raw, partially manufactured materials, processing machinery and equipment for all sorts of manufacturing plants. The exposition is under the management of the International Exposition Co., with headquarters at the Grand Central Palace, 480 Lexington Avenue, New York 17, N.Y.

The field of the exposition comprises the production of chemicals, the entire range of chemical processing and the use of chemical ingredients and chemical steps in connection with mechanical operations of all kinds, literally affecting all industries. The exhibition is a biennial fixture, designed to implement the specialist in his own field and to refresh his knowledge in spheres outside his own.

Exhibitors are principally specialists in commodities, manufacturing equipment or appliances, services, etc. Their goods are seldom confined to single applications, but more often have use in widely scattered fields. Admission to the exposition is by invitation and registration at the entrance. There is no charge for admission. The public is not admitted.

CASING PRODUCTION IN AUGUST DROPS .56% FROM JULY TOTALS

Production of all types of automotive casings during the month of August totaled 6,228,399 units, .56% less than the 6,263,676 casings produced in the previous month, according to the Rubber Manufacturers Association. Of the August totals, 5,538,251 were passenger casings and 690,148 were truck and bus casings, compared with the 5,507,334 and 756,342 units, respectively, produced during July.

A total of 7,767,941 casings were shipped during August, .96% more than the 7,693,978 casings shipped in the previous month. In August, 6,779,736 passenger casings and 988,205 truck and bus casings were shipped, against 6,795,517 and 898,461, respectively, for the month of July. Inventories of all types of casings as of August 31 stood at 9,969,660 units, of which 7,925,593 were passenger casings and 2,044,067 were truck and bus casings. At the end of the preceding month there were 11,716,755 units on hand, of which 9,335,979 were passenger type and 2,380,776 were truck and bus casings.

Passenger and truck and bus tubes shipped during August totaled 6,603,353 units, 4.82% more than the 6,299,602 tubes shipped during July. A total of 5,169,382 tubes were produced during August, 1.16% less than the 5,230,075 tubes produced in the previous month. As of August 31, there were 9,858,385 tubes on hand, compared with 11,364,436 tubes on hand at the end of July.

Minnesota Mining Offers Stock

According to information filed with the Security Exchange Commission, the Minnesota Mining and Manufacturing Co. of St. Paul, Minn. is offering 75,000 shares of its no par value common stock for sale to its employees under an employee stock purchase plan adopted September 16. The proceeds will be used for general corporate purposes, which may include retirement of a portion of the company's 2¾% debentures, due 1967, or its $4 preferred stock. The company owns or has an interest in five subsidiary organizations including the Inland Rubber Co., National Synthetic Rubber Corp., Mid-States Gummed Paper Co., National Advertising Co., and the Empire Advertising Co.

Diamond Alkali Trade Exhibit

In order to portray the important contributions of its chemicals to the end products and manufacturing processes of the nation's basic industries, Diamond Alkali Co., Cleveland, Ohio, has developed an interesting illuminated display for exhibition at trade shows in which the company plans to participate next year. Built in three sections, the 20-foot by 3-foot display highlights "chemical processing by push-botton control," figuratively speaking. Operation of an electrically-equipped keyboard lights up any one of 8 different panels, each of which gives a capsule description of a major Diamond product or group of products.

FINANCIAL NEWS

U. S. Rubber Co.

Nine Months: Net profit of $8,619,600, which is equal to $2.68 each on 1,761,092 common shares, compared with $15,216,798, or $6.42 each on an equal number of shares, in the corresponding period of the previous fiscal year. Net sales for the nine month period of 1949 amounted to $396,551,121, against $431,930,181 for the period ended September 30, 1948. The company's statement reflected foreign exchange losses resulting from devaluation of Latin American currencies, but not from devaluation by other nations. The report said it seems likely that any debits resulting from the change in currency exchange rates will be more than offset by non-recurring credits.

American Cyanamid Co.

Nine Months: Net income of $10,796,526, which is equal to $3.94 each on 2,740,001 common shares outstanding, compared with $10,353,762, or $3.78 each on 2,737,686 common shares for the first nine months of 1948. Excluding equity of other than wholly-owned subsidiaries, net income for the nine-month period of 1949 was $9,813,210, or $3.21 a common share, compared with a net of $8,487,791, or $2.73 a share, last year.

Brunswick-Balke-Collender Co.

Nine Months: Net Profit of $1,323,587, which is equal to $2.73 a share on net sales of $21,510,086, compared with $1,758,884, or $3.69 a share on net sales of $23,090,953 for the corresponding period of the previous fiscal year. Net profit for the third quarter was $1,167,459, equal to $2.52 a share on net sales of $10,614,527, against $1,256,793, or $2.73 a share on net sales of $11,035,576 in the third quarter of the preceding year.

New Jersey Zinc Co.

Nine Months: Net profit of $3,632,144, which is equal to $1.86 a share, compared with $6,361,542, or $3.25 a share, for the corresponding period of 1948. Net profit for the quarter ended September 30, 1949, amounted to $408,506, which is equal to 21c each on 1,960,000 shares, against $2,185,447, or $1.12 each on a like number of shares, for the quarter ended September 30, 1948.

Interchemical Corporation

Nine Months: Net profit of $1,307,069, which is equal to $1.57 a common share, compared with $1,598,258, or $2.00 a share, for the corresponding period of 1948. Net sales for the period ended September 30, 1949, amounted to $51,154,979, against $58,304,804 for the first nine months of the preceding year.

Boston Woven Hose & Rubber Co.

Year ended August 31: Net income of $510,511, which is equal to $5.46 a common share, compared with $1,004,440, or $11.24 a common share, the year before. Net sales for the 1949 fiscal year amounted to $13,143,719, against $17,591,385 in the previous fiscal year. Total current assets at the year-end stood at $5,838,815, while total current liabilities were $1,061,060. These figures compare with the 1948 fiscal year when total current assets were $6,749,205, and total current liabilities were $1,506,134.

Rome Cable Corp.

Six Months Ended September 30: Net profit of $86,606, compared with $508,938, or $1.23 a common share, in the like period of 1948. For the quarter ended September 30, 1949, there was an operating profit of $73,076, compared with a net profit of $278,340, equal to 68c each on 380,476 common shares, after preferred dividends, in the September quarter of 1948.

Hewitt-Robins, Inc.

Nine Months: Net income of $336,119, which is equal to $1.21 a capital share, compared with $390,186 in the corresponding nine month period of the previous year. For the quarter ended September 30, 1949, net earnings amounted to $90,116, equal to 32 cents a capital share, on sales of $4,677,258, against $155,469, or 56 cents a share, for the third quarter of 1948.

Collins & Aikman Corp.

Six Months Ended August 27; Net loss of $436,485, against a net profit of $431,236, or $.76 a share, for the corresponding six months of the previous fiscal year. The report states that the Canadian subsidiary, Collins & Aikman of Canada, Ltd., had a net profit after taxes for the six months ended August 27, 1949, of $151,810 (Canadian dollars).

Belden Manufacturing Co.

Nine Months: Net income of $275,596, which is equal to 86c a share, compared with $639,456, or $1.99 a share, a year ago. Net profit for the third quarter amounted to $83,888, which is equal to 26c a share, against $263,606, or 82 cents a share, for the corresponding period of the previous year.

Electric Hose & Rubber Co.

Year to August 31: Net income of $420,984, which is equal to $3.29 a common share, against $493,794, or $3.86 a share, in the previous fiscal year.

Firestone Buys Prize Bull

The highlite of the 12th annual auction of Hereford cattle by Oscar Nelson and Oscar Nelson, Jr., president and vice-president, respectively, of the United Carbon Co., was the purchase of the yearling bull, Mörlunda H. Monarch, for $8,500 by the Firestone Farms of Columbiana, Ohio. The sale was held at Mörlunda Farms, the Nelson homestead at Lewisburg, West Va. The auction, attended by almost 2,500, brought a total of over $80,000 for 61 lots of top breeding cattle, the average price being $1,316, the highest average obtained at any Hereford sale in the east since 1945. In connection with the auction, the United Carbon Co. played host to some 300 members of the rubber industry at the famous Greenbrier Hotel in White Sulphur Springs.

Monsanto Chemical Co.

Nine Months: Net profit of $11,555,833, which is equal to $2.48 a common share, against $11,568,483, or $2.51 a share, last year. The 1949 net was reached after deducting an amount equal to 4 cents a common share, resulting from revaluation of net current assets of the Canadian subsidiary.

United Carbon Co.

Nine Months: Net profit of $1,971,727, which is equal to $2.48 per share, compared with $2,284,773, or $2.87 a share for the corresponding period of 1948. The figures include totals for subsidiary companies.

National Automotive Fibres, Inc.

Nine months: Net profit of $3,680,999, which is equal to $3.69 each on 996,152 common shares, against $2,049,459, or $2.15 each on 953,779 common shares, for the corresponding period of the previous year.

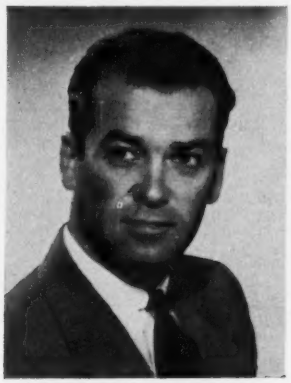
Sheller Manufacturing Corp.

Nine Months: Net profit of $2,910,598, which is equal to $5.21 each on 553,340 common shares, compared with $1,882,200, or $3.35 on an equal number of shares, in the corresponding period of 1948.

General Cable Co.

Nine months net income of $1,277,681, which is equal to 37c a common share, compared with $3,193,891, or $1.37 a share, the year before.

Benson Joins Industrial Rayon



Bjorn F. Benson

Bjorn F. Benson has been appointed a member of the research staff of the Industrial Rayon Corp., Cleveland, Ohio. He will be concerned with the development aspects of rayon for tires and other industrial products. Mr. Benson was a member of the technical staff of the B. F. Goodrich Co. for ten years prior to his appointment as technical superintendent of the Inland Rubber Corp., Chicago, Ill., in 1946. He held this position until this latest appointment. Mr. Benson is a native of Minneota, Minn., and is a graduate of Oregon State College in chemical engineering. He is a member of the American Institute of Chemical Engineers, the American Chemical Society and the Society of Automotive Engineers. While with Inland Rubber, he represented the company on the technical advisory committee of the Copolymer Corp.

Bickering on Black Production

A peculiar situation has arisen in England with regard to the manufacture of Philblack A and O by Philblack, Ltd. The latter company is constructing a plant near Bristol to manufacture these blacks under license of the Phillips Petroleum Co. The project has been approved by a number of government departments. Recently, however, the Ministry of Health issued an order calling for the registration of all manufacturing processes so that the health and welfare of all workers could be adequately protected. Since the Philblack process is a closely guarded secret and Philblack, Ltd., has agreed with Phillips Petroleum to maintain such secrecy, it has refused to file the requested details with the Ministry. At a public hearing, testimony was submitted to the effect that workers in the American Philblack plant have suffered no ill health and, further, that Philblack, Ltd., has made an agreement with the Bristol authorities covering any question of obnoxious gases, etc. No final decision has yet been reached in the controversy, but a satisactory solution is believed pending.

News in Brief

Hercules Powder has published a technical bulletin on "Naval Stores Resins in Natural Rubber Tread Stock," which indicates the relative oxygen absorption rate of these resins in test recipes.

"Your Guide to Profitable Installations of Modern Generators" is the title of a new 8-page, 2-color bulletin, published by Electric Machinery Manufacturing Co., Minneapolis 13, Minn., which outlines the selection of large AC generators.

Total tire-cord consumption in the second quarter of 1949 was 16.5 million pounds under the same period of 1948. Cotton cord was down from 72 million to 48 million. Synthetic cord was up from 60 to 68 million. It was only last year that synthetic overtook cotton in tire cord.

Men's shoe styles utilizing Lastex yarn manufactured by U. S. Rubber were introduced at the National Shoe Fair, held in Chicago, Ill., recently.

A further use for Velon plastic manufactured by the Firestone Plastics Co., was introduced in a new bedspread made of the material. A damp cloth is all that is needed to remove everyday dust and stains.

A tire plug made by Goodrich between 1890 and 1895 was recently sent to the company in Akron, still soft and pliable and fit for use.

Dee-Tek-Tube Tester Co., Lohrville, Ohio, has introduced a simple machine for spraying a special fluid through a valve stem in order to check for leaks. The liquid, called Dee-Tek-Sol, is "homogenized" and forms a spray as air passes through. The spray oozes through the tiniest hole, and spots the leak for patching.

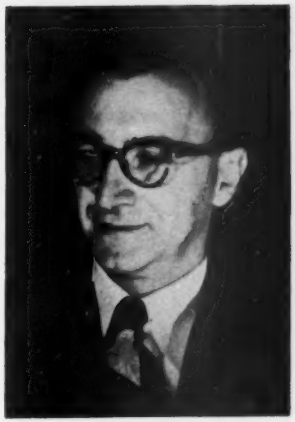
Goodrich has introduced its puncture-sealing tubeless tire in the Cleveland-northeastern Ohio market area, bringing to six the number of sales districts in which it can be purchased.

On or about August 1 Goodyear paid out its three-billionth payroll dollar. The first company payroll dollar preceded the record-making payment dollar by a matter of 51 years.

The Rubber Foundation, Delft, Holland, has prepared an 8-page brochure outlining its origin and function. A history of international cooperation in rubber is included. Copies can be secured from the Foundation on request.

Pliobond, the all-purpose adhesive which has proved highly successful in industrial applications, bonding anything to anything, is now available in household sizes, according to an announcement by Goodyear. It is being marketed in two convenient sizes.

Offers Consulting Services



Oscar Dobkin

Oscar Dobkin, formerly associated with the B. F. Goodrich and other rubber concerns, is now offering his services as a consulting technologist for product and formulae development as well as limited physical testing of natural and synthetic rubber compounds. Mr. Dobkin, who is also manager and co-owner of Jay-Dee, Inc., manufacturing chemists, maintains offices at 231 So. Balch St., Akron 2, Ohio. While with Goodrich, Mr. Dobkin specialized in the development and compounding of rubber hose. Other experience includes several years of technical work with smaller plants manufacturing printers' rollers, molded goods, and solvent-resistant products. From 1942 to 1946, Mr. Dobkin was an officer of the Chemical Warfare Service and went into the reserves as a major.

Ceramid Synthetic Wax

Glyco Products Co., Inc., Brooklyn 2, N. Y., has announced the availability in commercial quantities of Ceramid, a new synthetic wax. Chemically, the product is an alkyl stearamide. It is hard, light yellow in color and melts between 79.5°C. to 80.5°C. Ceramid is insoluble in water and is more soluble in organic solvents than natural and other commercial synthetic waxes. It is compatible, in varying proportions, with asphalt, carnauba wax, cumarone resins, ethyl cellulose, microcrystalline wax, paraffin wax, etc. Ceramid finds use in protective coatings and films to be deposited on various surfaces out of solvent solution. It may be used as an anti-tack agent for resin organisols, as a mold lubricant for rubber, or in blends with other waxes and hydrocarbons for special effects.

Corduroy Builds Plant Addition

Corduroy Rubber Co., Grand Rapids, Mich., has begun the construction of a $60,000 addition to its plant. The new structure, to be erected on the west side of the plant, is to be 112 by 219 feet and of brick and glass construction. Corduroy also built a $60,000 plant addition last year.

Fing-O-Tip Towel Holders

An ingenious use of rubber suction cups is found in the Fing-O-Tip individual towel holders currently being marketed by the A. J. Ganz Co., 112 No. Hayworth Ave., Hollywood 48, Calif. These suction cups, supplied in yellow, green, blue or red to match specific interiors, feature

rubber "grippers" that hold the material firmly but gently and yet permit instant removal. Although designed for towels, the holders are also suitable for cloths, aprons, etc., and lend themselves to use where other types of towel holders cannot be used. Excellent suction permits instant attachment to any smooth surface including glass, metal, porcelain and tile. In addition to the single holders, the company is also marketing a multiple unit consisting of four "grippers" set in a baked enamel metal base which is easily attached by two screws to doors and walls. The individual "grippers" are removable to permit easy cleaning and replacement if needed.

Hunter Joins Independent Die

Independent Die & Supply Co., St. Louis 4, Mo., has appointed Robert L. Hunter as company representative in the Milwaukee, Wisc., Chicago, Ill., and Michigan areas. He will maintain headquarters at 1225 N. Water St., Milwaukee. Independent Die was originally founded in Massachusetts in 1900. The St. Louis plant was founded in 1905, and in 1927 was divorced from the Brockton, Mass., branch. From that date, the St. Louis branch was known as the Independent Die & Supply Co. In May, 1947, the present owners of the company secured the New Era Die Co. of Red Lion, Penna. Carl F., Arthur W., and Courtney R. Lindholm are president, vice-president and secretary-treasurer of the company, respectively.

Rodic Rubber Changes Name

As of October 1, the name of the Rodic Rubber Corp., New Brunswick, N. J., was changed to the Rodic Chemical and Rubber Corp. Company officials advise that no change is contemplated in company activities or policies. Officers and executives of the company include: *Vice-President and General Manager*, P. S. Vincent; *Treasurer*, W. J. Carson; *Sales Manager and Technical Director*, D. F. Fraser; *Factory Manager*, J. S. Wade; *Production Manager*, C. C. Dickey; *Chief Chemist*, E. L. Macaulay.

LABOR NOTES

The executive board of the United Rubber Workers (CIO) has notified local boards not to accept agreements that call for reductions in pay. The action was taken after the board refused on October 12 to approve a contract between Local 283 at Norwalk, Conn., and the Norwalk Tire & Rubber Co. providing for pay cuts averaging about 11c an hour for about 600 employees.

No action was taken last month by the U.R.W. executive board with regard to the pension-insurance program which brought about a settlement of the recent five-week strike at Goodrich. Approval of the program, however, is expected within the next few weeks.

A settlement between the local union and the Lovell Manufacturing Co. at Erie, Penna., providing 10c an hour per worker for pensions and insurance was reached last month. This was the first such settlement made by one of the smaller rubber companies. Details of the program are currently being negotiated.

Wage negotiations between the U.R.W. and the U. S. Rubber Co. on a company-wide basis were begun in New York on October 17. Nineteen plants with about 30,000 workers are involved in the discussions. Only wages may be discussed under terms of the company-wide pact which expires next July.

Goodyear has been reported to have offered a pension program to the U.R.W. in wage negotiations held at Buffalo, N. Y., last month. It was further reported, however, that the union was insisting on a program under which the company would foot the entire cost.

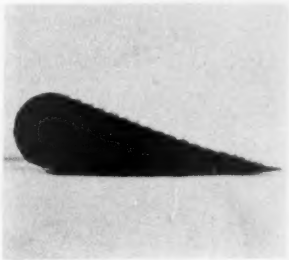
For the first time in the history of Local 87, employees at the Inland Manufacturing Division of General Motors at Dayton, Ohio, will be permitted to choose their own jobs when they are laid off from their "home department." The system of "chain bumping," denied workers at the plant since the union was organized in 1941, was declared permissible under the local agreement by arbitrators in a recent grievance case.

The plant of the Crown Rubber Co. at Fremont, Ohio, was closed for a short period last month when some 85 AFL employees went on strike on October 26 over discharge of a fellow worker. It was the first strike at the plant in several years.

Hunting boots of bright red, designed to highlight a sportsman's feet when he tramps through foliage or snow, have been introduced by Goodrich. The 12-inch rubber boots are fleece-lined and with an inside shearling cuff at the top.

Gripper Door Stop

A new type of rubber door stop, designed to hold a door in its proper place, has been developed by H. L. Blackwelder, 211 Fairson Ave., Salisbury, N. C. The new door stop will fit under any type of door and has a corrugated undersurface to prevent



slippage. Deep cut notches on either side of the upper surface guarantee a firm grip on the door itself, so that when once wedged into position there is little possibility of any movement of the door until the stopper is removed. Mr. Blackwelder is interested in hearing from any rubber manufacturer in a position to produce the Gripper Door Stop for him.

Producing Visqueen Film

Visqueen Film, a new type of polyethylene film, is currently being produced in commercial quantities by the Preston Division of the Visking Corporation, Terre Haute, Indiana. It is described by the company as a strong, clear, odorless, tasteless polyethylene film, having an unusual combination of chemical and physical properties. Chemically inert, acids and alkalis do not affect it, nor will it stick to itself or to products it contacts. Extremes of temperature have no effect on Visqueen film, with good results achieved even at temperatures as low as 94 degrees below zero. Being both waterproof and moisture-resistant, Visqueen is said to be particularly valuable for sealing pure chemicals and foods during shipment. It is particularly recommended by the company as a lining material for shipping containers.

Schulman Moves Offices to N. Y.

Headquarters of A. Schulman, Inc., formerly located in Akron, Ohio, are being moved to New York City, a move necessitated by the firm's increasing activity in the crude rubber business. Established in Akron 21 years ago, the firm maintains warehouses in that city and in Jersey City, N. J., and Los Angeles, Calif. It also maintains offices in Boston, Mass., New York and Los Angeles. The Akron plant will be continued and will not be affected by the shifting of executive personnel. In addition to being one of the world's largest dealers in scrap rubber and plastics, the company is enlarging its operations in new rubber and is selling throughout the world.

THE STORY BEHIND THE WORD...

SALARY...

During the days when the Roman Legions ruled most of the known world, salt was so scarce that it was considered as valuable as precious metals. As a consequence, the soldiers preferred to receive a part of their pay in salt. This salt money, or Salarium later became the word "salary" as we know it— a recompense paid for services rendered in business or the professions.

A long record of strength, stability and progressive leadership has made the word Muehlstein—the First Name in Scrap Rubber.

H. MUEHLSTEIN & CO. INC.

122 EAST 42nd STREET, NEW YORK 17, N. Y.

BRANCH OFFICES: Akron • Chicago • Boston • Los Angeles • Memphis

WAREHOUSES: Jersey City • Akron • Boston • Los Angeles • Memphis

CRUDE RUBBER · SYNTHETIC RUBBER · SCRAP RUBBER · HARD RUBBER DUST · PLASTIC SCRAP

CANADIAN NEWS

Following a recent meeting of the board of directors of Dunlop Tire & Rubber Goods Co., Ltd., it was announced that J. I. Simpson had retired as general manager, continuing as president of the firm. Mr. Simpson has been president as well as general manager since his appointment in 1939. D. B. Collett, formerly general works manager of the Speke, Liverpool, England, plant of the Dunlop Rubber Co., Ltd., has been named general manager and a vice-president of Dunlop Tire, succeeding Mr. Simpson. In his former capacity, Mr. Collet was responsible for converting an aircraft assembly plant to a modern rubber factory employing about 7,000 persons, following World War II.

The Bureau of Statistics reported that rubber consumption dropped slightly in August, totaling 9,789,600 pounds, compared with 9,840,700 the month before. Consumption of natural rubber fell from 5,493,600 to 5,448,100 pounds, while reclaimed rubber fell from 1,747,600 to 1,684,000 pounds. Consumption of synthetic rubber increased from 2,599,600 pounds to 2,657,000 pounds.

Production of synthetic rubber increased from 9,226,000 pounds to 9,959,000 pounds, while production of reclaimed rubber advanced sharply to 681,000 pounds from 310,000. The use of rubber for tires dropped by 1,046,500 pounds. Rubber use in footwear increased by 519,500 pounds.

Quebec may be the first province in Canada to have rubberized asphalt highways. The new process in highway surfacing is scheduled to have its first actual try-out over a one-mile stretch along Highway No. 11 in the Ste. Therese district. Tests on rubber highway surfacing materials have been carried out in the United States for the past two years. Rubber-asphalt combinations have been used abroad, particularly in the Netherlands, with some success.

T. M. Mayberry, vice-president of the Firestone Tire & Rubber Co. of Canada, has announced that his company has plans for building in the western sections of Canada. New warehouses are to be built in Regina and Vancouver. An addition to warehouse and office facilities in Edmonton is also planned. According to Firestone, the main factors in the western expansion are increases in farm mechanization and growth of population and highway traffic.

The current year is proving to be the best in the history of the Canadian Tire Corp. Business volume continues to increase and sales for the seven months ended July 31, were approximately 30% greater than for the corresponding period of 1948. Present trends indicate that results for the year will surpass the record established in 1948. Canadian Tire plans to establish three new stores when suitable locations can be obtained.

The plant of the Canadian Johns-Manville Co., Ltd., at Asbestos, Quebec, has been expanded in recent months, and the company has added molded brake linings to its line. Woven brake lining has been made at this plant for a number of years. GR-S-impregnated fabric strips are being used in the molded linings, with the company compounding its own rubber.

Limited production was recently resumed by the Cambridge Rubber Co., Ltd., at its St. Remi de Napierville plant. A line of women's and children's rubber footwear is currently being produced, and there is some talk of expanding production in the near future to produce both molded goods and latex dipped specialties.

Dominion Rubber Co. has announced that G. W. Charles, vice-President and general manager of the footwear division, will retire at the end of the year under the company's pension plan. He will be succeeded as general manager of the footwear division by H. Wolfhard.

R. M. Ferguson & Co., manufacturer's sales representatives in the Canadian area, has moved to new headquarters at 81 Dunedin Drive, Toronto 18, Ontario. The new phone number is MUrray 5612. The company is headed by Ralph Ferguson.

LOS ANGELES NEWS

The November 1 meeting of the Los Angeles Rubber Group held at the Hotel Mayfair, Los Angeles, Calif., was sponsored by the W. J. Voit Rubber Corp. Page Parker, vice-president of the company, acted as host for the meeting. At a technical meeting preceding the regular meeting, Ira Williams, research director of the J. M. Huber Corp., Borger, Texas, spoke on "Oxidation and Antioxidants." Mr. Williams received the Charles Goodyear Memorial Medal in 1946.

Mr. Williams noted that the oxidation of rubber and the combination of rubber with sulfur are similar in some respects. Both oxygen and sulfur combine with rubber at a constant rate until the oxygen or sulfur is nearly all consumed. Both oxygen and sulfur probably attack both double bonds and alpha carbon atoms. Ordinary aging is probably caused by massive oxidation which attacks alpha carbons. This action is promoted by the presence of either combined oxygen or combined sulfur.

Flex cracking appears to be a type of massive oxidation. Sun cracking and mastication oxidation attack double bonds. Antioxidants are not effective against oxidation at double bonds. Antioxidants probably act as deactivators of combined oxygen or sulfur to reduce the rate of massive oxidation to a rate normal for rubber hydrocarbon.

The regular meeting of the group was entertained by a talk on football by Mike Pecarovich of Voit Rubber. Mr. Pecarovich's past experience as a coach with Santa Clara, Gonzaga and Loyola Universities, in addition to his past seven years' association with professional teams, lent an air of authenticity to his talk.

W. M. "Bill" Moser has resigned his position with the Kirkhill Rubber Co., and is now on an extended trip through the East.

Standard Products Co. has started production at its new factory at Long Beach, Calif. L. B. Blythe is general manager. Headquarters of Standard Products is in Cleveland, Ohio. The Long Beach plant manufactures rubber and fabric-covered steel channels and strips, primarily for the automotive industry. It is anticipated the plant will employ about 100 persons when in full production.

R. E. Hutchinson, chief chemist at Firestone, has been elected a member of the board of directors of the Rubber Division of the American Chemical Society, representing Southern California.

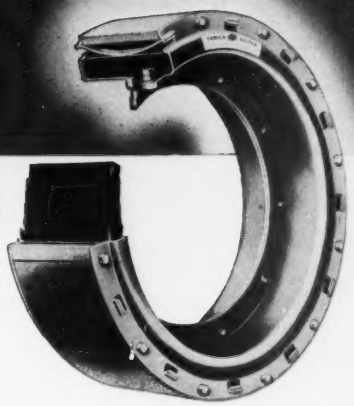
Tom Squires is now associated with the W. J. Voit Corp. as a laboratory chemist.

Walter R. Westman is no longer Associated with Atlas Sponge Rubber. Mr. Westman has had 11 years of experience with Goodrich, Inland Rubber and the Griffith Rubber Mills.

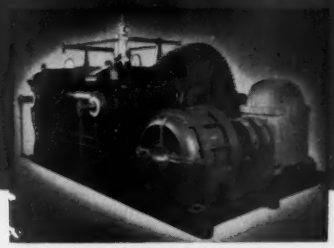
The basic rubber technology course offered by TLARGI has proven to be very popular. There were 37 applicants, but due to limitations of space and personnel only 20 were accepted. The Committee had a difficult time in selecting the successful applicants. Selections were made on the basis of preference being given to production and technical men over those in sales. The planning, arranging and financial underwriting of this course will prove to be of material benefit to the 20 TLARGI members this year and an increasing number in the future.

FAWICK-EQUIPPED MACHINES

do More Work at Less Cost



Fawick Air-Ring Clutch or Brake Type E



Fawick Airflex Clutch and Brake on Standard No. 7 Heavy-Duty Warming Mill manufactured by Stewart Bolling & Co., Inc., Cleveland, Ohio.

Fawick Airflex Clutch and Brake on Rubber Mill drive at Rome Cable Co., Rome, N. Y.

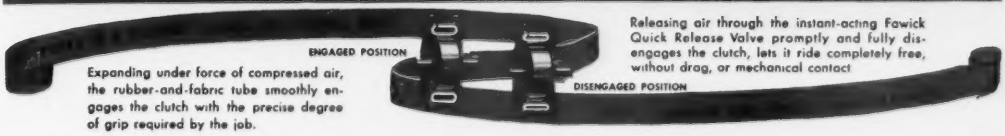
Fawick Airflex Clutch and Brake on two Allen Mills at Hartz-Mason, Inc., Watertown, Mass.

Time-wasting clutch adjustment down time is practically eliminated on Fawick-equipped machines. The moving parts of this Fawick Clutch—the rubber-and-fabric pneumatic tube and the friction shoe assemblies—adjust automatically and compensate for wear.

The smooth engagement action of this Fawick Clutch eliminates sudden shock loads which damage machinery. Controlled torque starting can be obtained with a simple modulating air valve. This type Fawick Clutch is ideally suited to continuous slip applications.

For specific recommendations for your machines, write to our Engineering Department today. Address Dept. RA.

FAWICK Airflex CO., INC.



Expanding under force of compressed air, the rubber-and-fabric tube smoothly engages the clutch with the precise degree of grip required by the job.

Releasing air through the instant-acting Fawick Quick Release Valve promptly and fully disengages the clutch, lets it ride completely free, without drag, or mechanical contact

OBITUARIES

Amos C. Miller

Amos Calvin Miller, former vice-president, director and general counsel of the Firestone Tire & Rubber Co., died on October 18 in Wesley Memorial Hospital, Chicago, Ill. He was 82 years old. Mr. Miller was a Firestone director from the date of its incorporation in 1900 to his resignation in 1925. He was elected vice-president in 1912 and served in that capacity and as general counsel until leaving the company.

Born in Marshalltown, Iowa, Mr. Miller was graduated from Oberlin College and the Chicago Kent College of Law. He began practicing law in 1891, and from 1895 to 1912 was a member of the firm of Lachner, Butz and Miller. He had been a senior partner in Miller, Gorham, Wescott & Adams and its predecessor firm since 1912. He was also a director and for many years a member of the executive committee of the Chicago Title and Trust Co. Mr. Miller headed the Chicago Bar Association in 1918-19 and the Illinois State Bar Association in 1931-32.

A donor of many scholarships to Oberlin College, Mr. Miller was a trustee of that institution from 1912 to 1947. Among other organizations of which he was a member were the American Bar Association, American Law Institute, Legal Club, Chicago Law Institute, Chicago Art Institute and the Law Club, of which he was president in 1921. His wife and three sons survive.

Samuel L. Gotshall

Samuel L. Gotshall, director of the White Rubber Co., Ravenna, Ohio, died on October 11 at his home in Zanesville, Ohio. He was 73 years old. Mr. Gotshall founded a small rubber company in Kent, Ohio, which later was taken over by White Rubber. In 1928 he joined the White firm, serving as a director from that time until his death. During his association with the company he worked as a salesman, retiring in 1942. Mr. Gotshall was also interested in the real estate business and formerly operated a meat market in Akron. Funeral services were held on October 14 in Zanesville, with burial in that city. His wife survives.

Harry B. Stewart

Harry B. Stewart, executive vice-president and sales manager of the Metal Hose and Tubing Co., Dover, N. J., died unexpectedly on October 29, at his home in Denville, N. J. He was 56 years old. A native of Brooklyn, N. Y., Mr. Stewart was at one time employed by Aqua System, Inc., Bronx, N. Y., as purchasing agent. He was a veteran of the first World War.

Charles F. Orr, Jr.

Charles F. Orr, Jr., sales manager of special accounts of the Mansfield Tire & Rubber Co., Mansfield, Ohio, died on October 8 in Durham, N. C. He had been in ill health and had entered a hospital in Durham for treatment. He was 45 years old. A native of South Attleboro, Mass., he was a graduate in textile engineering of the New Bedford Technical Institute, New Bedford, Mass. He became associated with the Mansfield company in 1929, first with the fabric laboratory, and later with the engineering staff, serving as sales engineer. For three years he was district sales manager of the company, in charge of the southeastern section of the country. In February of this year he was appointed to the post of sales manager of special accounts. He was a member of all Masonic bodies, including the Shrine Club, as well as the Westbrook Country Club and the University club. His wife and daughter survive.

Omar T. Frick

Omar T. Frick, president of the Standard Ultramarine Co., Huntington, W. Va., and a former vice-president of the West Virginia Manufacturers' Association, died on October 20 of a heart ailment. A native of Evansville, Ind., he came to Huntington more than 50 years ago and had been a leader of the industrial, civic and social life of the city. In 1909, he organized the Standard Ultramarine Co. at Tiffin, Ohio. He opened the Huntington plant in 1913.

Brian R. Muirhead

Brian R. Muirhead, vice-president and treasurer of the Universal Oil Products Co., Chicago, Ill., died on October 20 while on a train enroute to Detroit, Mich. A native of Dresden, Kan., Mr. Muirhead formerly had been treasurer of the Arkansas Natural Gas Corp. of Shreveport, La. He had been in the petroleum industry for more than 25 years. In may, 1945, he came to Chicago as treasurer of Universal and several months later was elected vice-president.

Ray Allen Whidden

Ray Allen Whidden, retired president of the Bauer & Black Division of the Kendall Co., Chicago 16, Ill., died on October 11 in Mills Memorial Hospital, San Mateo, Calif., after a long illness. He was 69 years old. Born in Oakland, Calif., Mr. Whidden was a graduate of the University of California. He had spent much of his adult life in Chicago with the concern he headed. His widow and two daughters survive.

Albert F. Tallmer

Albert F, Tallmer, secretary-treasurer of the U. S. Rubber Reclaiming Co., Buffalo 5, N. Y., until his retirement several weeks ago, died on October 27 in Mount Sinai Hospital in New York City after a long illness. He was 58 years old. Born in Richmond, Va., in 1891, Mr. Tallmer had been associated with the rubber reclaiming business for 40 years. He came to New York at the age of 16, and started work with U. S. Rubber Reclaiming on October 15, 1906, as an office employee. Eventually, he started his selling career and worked as a sales representative until he became a director and secretary of the company about 15 years ago. He was a member of the New York Rubber Group and of the Crude Rubber Group of the National Credit Office. Funeral services were held on October 27 in New York City. He is survived by two sons.

Charles B. Whittelsey

Charles B. Whittelsey, one time president of the Hartford Rubber Works and a former executive vice-president of the Hartford Chamber of Commerce, died at his home in Hartford, Conn., on October 16 at the age of 80. Mr. Wittelsey was associated with the Travelers Insurance Co. for seevral years before entering the rubber industry in 1901 when he joined the Hartford Rubber Works as a clerk in the purchasing department. He was named secretary and factory manager of that company in 1912 and elected president in 1917. When the Hartford Rubber Works were absorbed by the U. S. Rubber Co. in 1927, Wr. Whittelsey remained in an executive capacity, retiring from the company in 1930. A widow survives.

William Smyth

William Smyth, secretary-treasurer of the Eberhard Faber Rubber Co., Newark, N. J., and the Eberhard Faber Pencil Co., Brooklyn, N. Y., was killed in an air crash on November 1, while on a business trip to Washington, D. C. An Eastern Airlines DC-4 in which Mr. Smyth was riding was struck in mid-air over Washington Airport by a Bolivian fighter plane on a training mission. All 55 occupants of the airliner perished. Mr. Smyth was 39 years old. During the war years he served as a lieutenant commander in the U. S. Navy. He was a graduate of Yale University. His wife and 3 children survive.

William P. Reichwald

William P. Reichwald, for the last 22 years production supervisor for the plant of the S. S. White Dental Manufacturing Co. at Princess Bay, S. I., N. Y., died on October 11 at the Richmond Memorial Hospital, Princess Bay. He was 64 years old. Born in Griefswald, Germany, Mr. Reichwald had made his home on Staten Island since 1916. He was a member of the Staten Island Foreman's Club.

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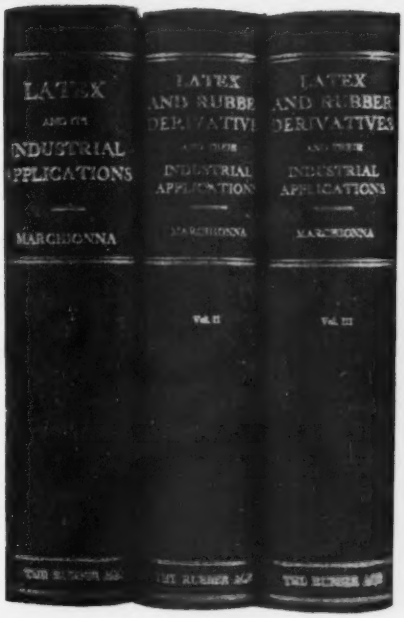

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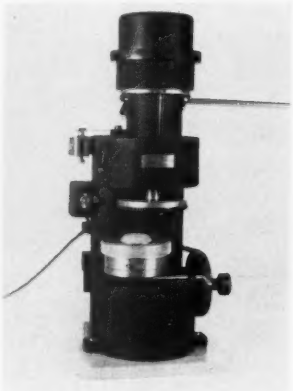
NEW EQUIPMENT

Schiefer Abrasion Tester

Developed at the National Bureau of Standards in connection with a program of research on the abrasion resistance of textiles sponsored by the Office of the Quartermaster General, the Schiefer Abrasion Testing Machine is now available from Sherman W. Frazier, 953 Fifteenth Street S. E., Washington 3, D. C. In this machine the specimen and abradant with their surfaces



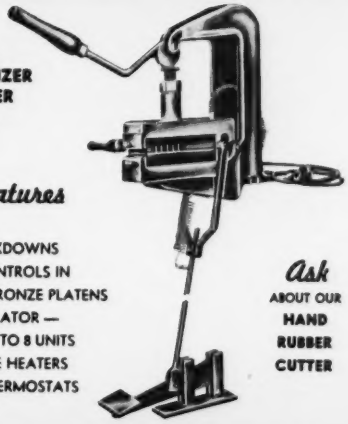
Front view of the Schiefer Abrasion Tester

pressed together rotate in the same direction and with the same angular velocity but with their axes of rotation one inch apart.

Features of the machine include specimen mounting which permits removal of the specimen for examination and measurement during a test and return to the machine without disturbing the mounting. Constant, adjustable tension on the specimen is provided throughout the test with take-up of stretch. Constant, adjustable pressure of abradant on the specimen throughout the test is also provided. Another advantage lies in the uniform abrasive action applied from every azimuthal direction in the plane of the surface being tested, in each rotation of the specimen. The machine has been applied successfully for testing rubber, plastic films, leather and paper, and is applicable to other materials.

In making a test the pressure of the abradant on the specimen can be varied by increments of one pound by placing auxiliary weights on the hub specifically mounted on the top of the abradant shaft for this purpose. The rate of abrasion, which increases with the downward pressure of the abradant, can be such that the material being tested is worn to destruction in an appropriate time interval. Pressure plates of any diameter up to 2 inches can be provided. The rate of abrasion can be greatly changed by using pressure plates of different diameter.

THE SMACO GASKET SPLICER



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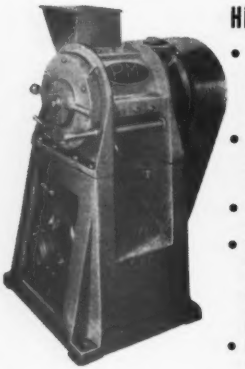
P. M.
GRINDING AND CUTTING EQUIPMENT



HEAVY DUTY CUTTER

- This machine is specially designed for reducing to small size pieces all kinds of soft and hard rubber scrap.
- Water cooled sides allow continuous operation of the machine, without overheating.
- Provided with safety type drive pulley.
- The capacity of the P.M. CUTTING MACHINE is from 600 to 1000 lbs. per hour on soft rubber and 1000 to 1500 lbs. on hard rubber scrap.
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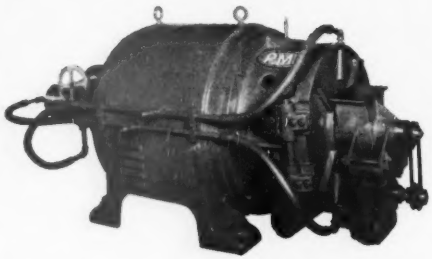

HEAVY DUTY RUBBER GRINDER

- Available in Direct or Belt Drive.
- 50 H.P. motor.
- Operation entirely automatic.
- Water cooled to permit continuous operation without overheating.
- Fineness of ground rubber easily adjusted by simple turn of wheel.
- Capacity 400 to 800 lbs. per hour.

Developed to meet the need for a more rugged Scrap Rubber Grinder with increased capacity

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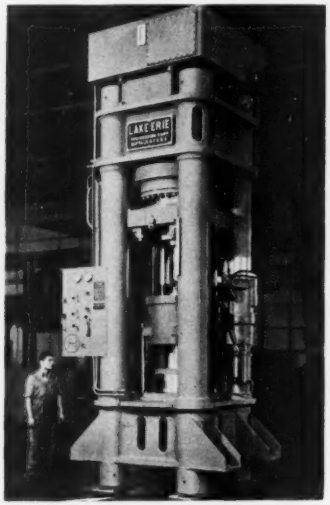
Forest Hills, L. I., N. Y.

Lake Erie Lead Extrusion Press

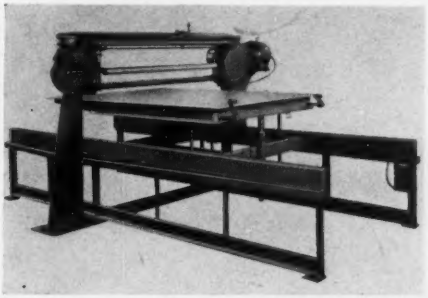
Said to be 30% faster than presses previously available, Lake Erie Engineering Corp., Buffalo 17, N. Y., has developed a series of lead extrusion presses for cable and hose encasing. The new extrusion presses are fully automatic and are designed to require a minimum of



floor space and to allow a maximum of accessibility to all working parts. The largest model has a capacity of 2,500 tons and is fitted with an automatic billet loader. Two other models have capacities of 1,000 tons (as depicted herewith) and 500 tons, respectively. They can be equipped with either automatic or manual billet loaders as required. All models are self-contained, four-column, downstroke types. The columns are fitted with spacers which provide the rigidity of a housing type press while maintaining the die accessibility of an open four-column unit. All piping is threaded, assembled and welded, assuring leak-proof operation.

Campbell Cushion Cutter

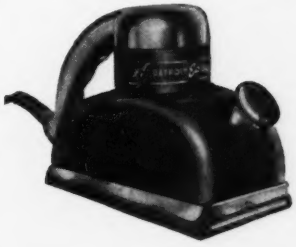
The cutting and slitting of foam rubber and other materials on the same machine is a feature of the Campbell Foam Rubber Cushion Cutter, designed by the Campbell Machinery Development Co., and built by the



Falls Engineering and Machine Co., both of Cuyahoga Falls, Ohio. The operator can cut contours and angles in stock as thick as eight inches, using a cutting head. Then he simply removes this head, inserts a splitting head, and splits stock, some as thin as 1/16th of an inch. The machine is being built in three sizes, 45 x 56 table size, 45 x 84 table size, and 64 x 96 table size. The cushion cutter will make concave and convex cuts the full width of the material, which is fed under the saw blade on a table top, adjustable vertically and horizontally. The table top moves back and forth on a roller carriage.

Detroit Easy Finisher

Vibrationless operation, plus straight-line sanding, rubbing and polishing, are features of the new portable, electric Model DF, Detroit Easy Finisher, produced by the Detroit Surfacing Machine Co., 7433 West Davison, Detroit 4, Mich. Straight-line sanding is said to duplicate the natural back-and-forth motion of hand work. This action is required for most finishing applications, because it does not sand cross grain, cut swirls, winkers, chain or

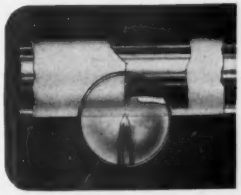


other hard to cover patterns. It also permits working up to moldings or right angles without marring or scratching. A streamlined rear handle provides for one hand operation. An instantly attached front guide handle is furnished with each machine for use on overhead work and other jobs where two hand operation is more comfortable. A new, easy to use abrasive sandpaper holder permits attaching several sheets at one loading.

How *Camachines* have increased the sales appeal of friction tape

THE PROBLEM ▶

At one time rolls of friction tape were made by pressing a knife through long rolls of the material and the paper core. Rolls were misshapen. The edges of the tape were frayed, tangled, stuck together—a constant annoyance to the user.



◀ THE SOLUTION

The Camachine score cut method was adapted to a slitter-winder specially designed for fast production of top quality rolls of friction tape. Note how the web is cleanly parted by pressure of the slitter wheels against the smooth steel backing roller.

THE RESULT ▶

Clean-cut rolls that separate easily. Tape with clean, frayless edges that will not ravel. Camachine 26-4D handles web as wide as 49"; slits strip as narrow as ½" across the full width of the web; removes and rewinds the liner from the original roll.

This major improvement in friction tape was achieved because a production-minded idea man called in a Camachine expert to help work out a problem. Many other cost-cutting Camachines for the rubber industries have been developed in the same way. If you're looking for increased roll production, improved roll quality and lower costs, why not ask to see what we can do for you?

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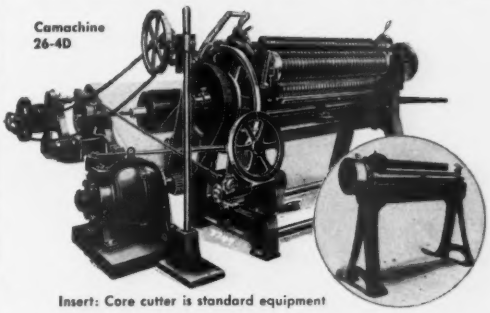
Camachine 26-4D



Insert: Core cutter is standard equipment

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AA-208

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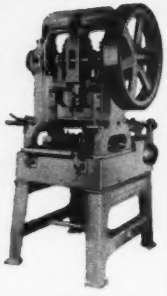
1. MODEL A 1—cutting Heels at high speed production or short runs.

2. Model A 2—cutting Multiple Heels, Half and Full Soles with stock grain.

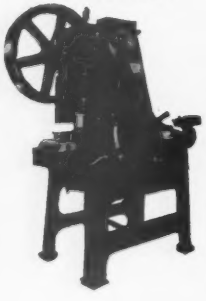
3. Model A 3—cutting Multiple Heels and Taps with or across stock grain.

4. MODEL A2s (Not illustrated) —cutting cross grain of stock.

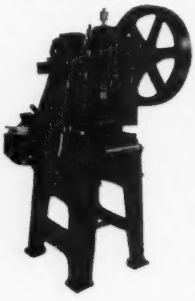


MODEL A2

MODEL A1



MODEL A3



MORE and MORE "UNIFORM QUALITY"

Years of comparisons for wear and service have proven COULTER offers more in higher quality cuttings . . . more in greater production. There is a COULTER MACHINE for cutting volumetric control and stripping of heels, soles, taps and other molded products. Specify a Coulter "Uniform Quality" Machine.

PRODUCTION MACHINES SINCE 1896

The James COULTER Machine Co.

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Cumberland Granulating Machine

Specifically designed for installation adjacent to an injection molding machine, a new plastics granulating machine manufactured by the Cumberland Engineering Co., Inc., Providence, R. I., permits the operator of the injection molding machine to trim parts and feed the

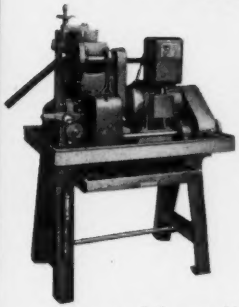
sprues and runners into the granulating machine. The manufacturer offers these machines in two sizes. The new machines feature a smaller motor in the base, a V-belt drive and a built-in, dust-tight material container. The smaller machine of this style (illustrated herewith) occupies a floor space of 27¼ inches by 20½ inches, and the larger machine, 30½ inches by 23¾ inches.

MODERN DEFINITIONS

Philistine?

SEE PAGE 124

For Immediate Shipment.. Thropp Automatic



Washer Cutters

THE Thropp Automatic Washer Cutter does not require mandrels. It will cut washers for hose connections, bottle stoppers, plumbers' washers, synthetics, uncured stock for molds, etc. A single unskilled operator can run one or more of these machines at the same time. Size of Cuts: 1/4" in diameter to 1¾" inclusive, and from 3/32" to 1½" in length.

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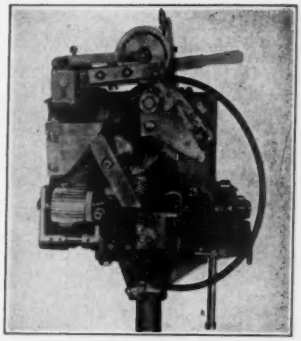

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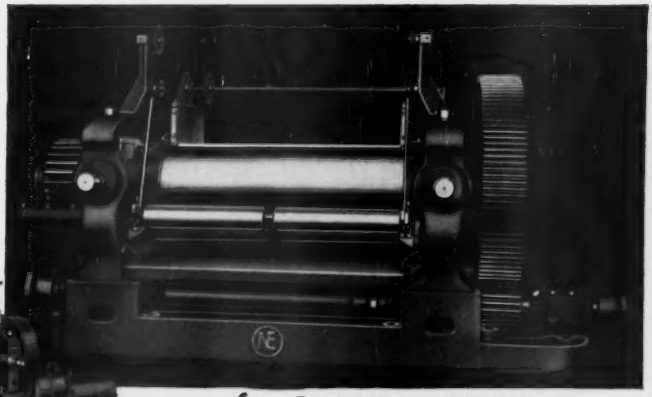

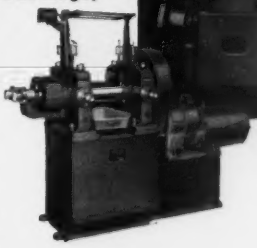

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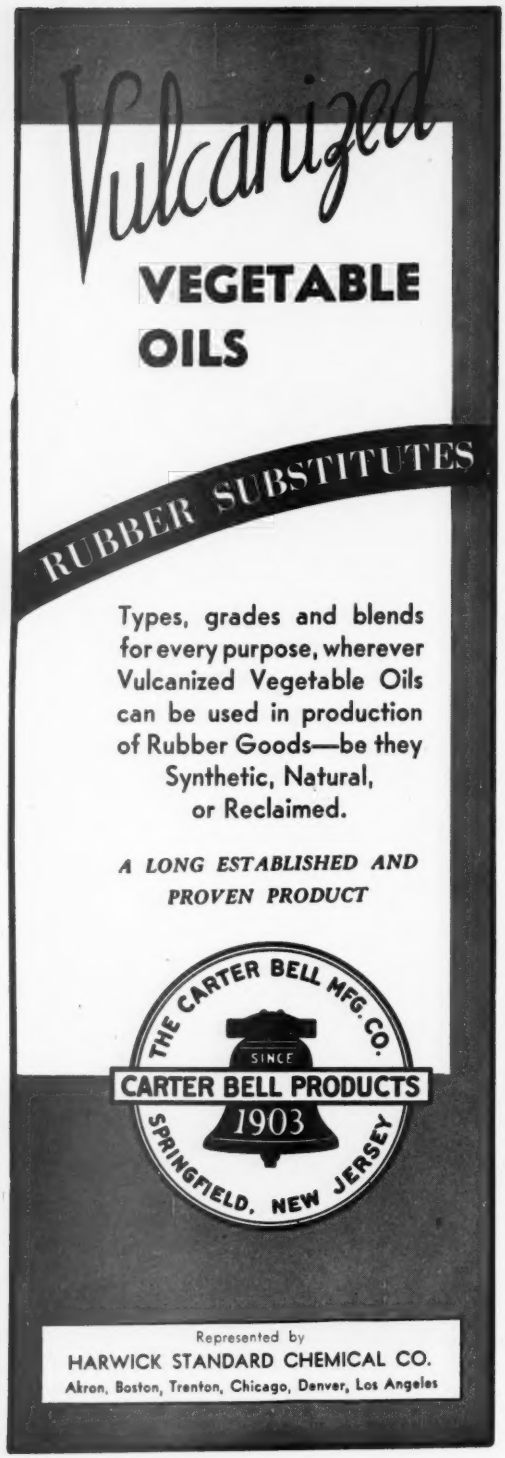
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REVIEWS

BOOKS

Proceedings of the Second Rubber Technology Conference: 1948. Edited by T. R. Dawson. Published by W. Heffer & Sons, Ltd., Cambridge, England. Available in the United States from Rubber Age, 250 West 57th St., New York 19, N. Y. 7¼ x 9¾ in. 523 pp. $13.00.

The Second Rubber Technology Conference, under the auspices of the Institution of the Rubber Industry, was held in London, England, on June 23-25, 1948. A total of 43 papers was presented, and all these papers together with the discussion which followed them are presented in this volume. In several cases the discussions have been extended by communicated notes.

The papers are arranged according to the conference sessions which were devoted to the following subjects: Synthetic Rubbers, Chemistry of Rubber, Physics of Rubber, Testing and Analysis, Latices, Compounding Ingredients—General and Carbon Black, and Factory Processes and Products. Although a review of the numerous papers would be too complex, we are listing below the titles and authors by conference subject:

Synthetic Rubbers: Comparisons of Natural and Butadiene-Styrene Rubbers, by R. P. Dinsmore and J. P. Fielding: Silicone Rubber, by S. L. Bass; Low-Temperature Performance of Butyl Inner Tubes, by R. J. Adams, E. J. Buckler, and G. G. Wanless; Preparation and Properties of Buna N Type Copolymers, by J. F. Nelson and B. M. Vanderbilt; Some New Compositions Based on Condensation Rubbers, by D. A. Harper, W. F. Smith, and H. G. White; Alteration of Neoprene by Polymerization Temperature, by H. W. Walker and W. E. Mochel.

Chemistry of Rubber: Nature of the Sulfur Linkages in Rubber-Sulfur Vulcanizates, by G. F. Bloomfield; Hydrochlorination of Rubber in Latex, by G. J. van Veersen; Some Observations on the Oxidation of Rubber in Light, by R. L. Stafford; Kinetic Analysis of Rubber Halides, by G. Salomon, C. Koningsberger, and A. J. Ultee; Direct Determination of Oxygen in Rubbers, by W. T. Chambers; Kinetic Study on the Oxidation of Rubber, by J. Le Bras and A. Salvetti.

Physics of Rubber: Refractive Index of Natural Rubber for Different Wave Lengths, by L. A. Wood and L. W. Tilton; Experimental Methods in the Osmometry of Dilute Rubber Solutions, by H. W. Melville and C. R. Masson; Degree of Crystallization in Natural Rubber, by J. M. Goppel; Permanent Set in Vulcanized Rubber, by L. Mullins; Free Retraction of Elongated Rubbers, by B. B. S. T. Boonstra; Some Applications of Elasticity Theory to Rubber Engineering, by R. S. Rivlin; Load Deflection Factors in the Design of Rubber Suspension Units, by H. L. Jenkins and D. H. D. Cooper.

Testing and Analysis: A Tackmeter for Rubber Testing, by E. W. J. Beaver, P. G. Croft-White, P. J. Garner and G. Rooney; Meaning of Test Results, by R. G. Newton; Interpretation of Plasticity Measurements, by J. R. Scott and R. W. Whorlow; Tear Resistance of Vulcanized Rubber, by H. A. W. Nijveld; Tear Initiation and Tear Propagation, by J. M. Buist.

Latices: Mechanism of the Creaming of Latex, by W. S. Davey and K. C. Sekar; Fresh Hevea Latex, by L. N. S. Homans and G. E. van Gils; Studies in the Coagulation of Preserved Latex by Sodium Silicofluoride, by E. A. Murphy, E. W. Madge, and D. W. Pounder; Control of Undesirable Viscosity Increases in Latex Compounds, by C. F. Flint; Preparation and Properties of Highly Purified Rubber, by G. Martin; Possibility of Using Tannins as Coagulants for Natural Latex, by H. A. Leniger and G. Verhaar; Degree of Swelling of Natural and Buna Latex Films in Water, by O. Bachle.

Compounding Ingredients—General: Light Phenomena on Elongating Vulcanized Rubbers, by A. van Rossem; Theory of Filler Reinforcement, by E. Guth; Effect of Pigments on Elastomer Properties, by L. H. Cohan; New Principles in the Manufacture and Use of Factices and Factice-Like Materials, by K. C. Roberts and J. H. Carrington.

Compounding Ingredients—Carbon Black: Effects of Carbon

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Hand Grip Rubber Gauge No. 3-B

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Depth of Throat ....6½"	Dia. 50 Divisions Each Div. 1/1000"	Weight ....4 lbs. Frame Aluminum

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Water-dispersible—for latex

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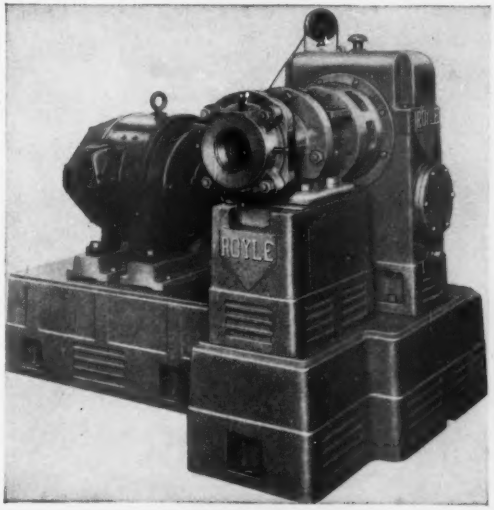
Send for your copy of Bulletin No. 448. It describes these features and how they may be applied to older type extruders.



ROYLE # 2 Extruding Machine. Non-extended cylinder, plain tubing head.

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Scrap Rubber
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Natural Rubber
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Plastic Scrap

Blacks on the Viscosity of Rubber, by I. Drogin; Nature and Activity of Carbon Black Surfaces, by W. R. Smith and W. D. Schaeffer; Structures in Rubber Reinforced by Carbon Black, by A. F. Blanchard and D. Parkinson; Compounding Significance of Carbon Surface, Structure and pH, by D. F. Cranor.

Factory Processes and Products: Factors Affecting the Power Consumption of Pneumatic Tires, by R. D. Evans; Applications of a High Tenacity Rayon in the Rubber and Plastics Industries, by D. Finlayson and T. Jackson; Testing and Use of Rayon for the Manufacture of Tires, by G. Fromandi; Latex-Reclaim-Casein Mixtures for Rubber-Cord Fabric Adhesion, by E. R. Gardner and P. L. Williams.

In addition to the papers listed above, the volume also includes a discussion on tensile strength, hardness, abrasion, and tear testing of vulcanized rubber. Lists of officials and delegates to the conference are also included, as is brief reference to the various social functions.

•

Acetylene and Carbon Monoxide Chemistry. By J. W. Copenhaver and M. H. Bigelow. Published by Reinhold Publishing Corp., 330 West 42nd St., New York 18, N. Y. 6 x 9 in. 357 pp. $10.00.

This is the first complete, critical treatment of the chemistry of acetylene under pressure. It describes in considerable detail all major chemical processes based on acetylene, including butadiene and acrylonitrile, with particular reference to some of the newer developments in Germany, the United States, and elsewhere. The development of the chemistry of acetylene under pressure is traced in a clear, orderly fashion and covers the application of this relatively new technique to the four major fields of vinylation, ethinylation, polymerization and carboxylation. The newer phases of carbon monoxide chemistry are discussed as well as the many newer or cheaper processes for producing high grade resins, synthetic oils and lubricants, natural and synthetic fuel gases, organic chemicals, synthetic rubbers and textile fibers. The Reppe process is outlined in detail. The book has seven chapters, an extensive bibliography, and a subject index.

•

Review of Current Research and Directory of Member Institutions. Engineering College Research Council of the American Society for Engineering Education, College of Engineering, State University of Iowa, Iowa City, Iowa. 6 x 9 in. 186 pp. $1.75.

Over 4,000 current college and university research projects in engineering subjects, representing expenditures of over $35,000,000, are listed in this book. Entries in the book from 82 educational institutions which hold membership in the Research Council describe the administrative policies for conducting engineering research, and list the responsible personnel, research expenditures, short courses and conferences of special interest, and the title of all engineering research studies currently active at each institution. Use of the volume is facilitated by a breakdown of research projects according to the engineering departments involved, and by a complete index to research project subjects.

•

The Supervisor's Management Guide. American Management Association, 330 West 42nd St., New York 18, N. Y. 6½ x 9 in. 200 pp. $3.00 to members; $3.50 to non-members.

Case histories and discussions of successful supervisory programs and techniques developed by companies in all types of industry are presented in this guide. Basic principles of sound human relations, supervisory attitudes and practices and their effects on worker morale and productivity, the executive responsibility for developing morale, dealing with emotional problems on the job, the art of speaking effectively to employees, tests for determining competent supervisors and executives, and related subjects are presented. The book is published in eight sections and twenty chapters prepared by 17 operating executives and specialists in the field.

BOOKLETS, CATALOGS, etc.

Farrel-Birmingham Rubber Mills, Plastic Mills, Refiners, Washers, Crackers. (Bulletin No. 173). Farrel-Birmingham Co., Inc., Ansonia, Conn. 8½ x 11 in. 40 pp.

The contents of this bulletin include a table of sizes, capacities, power requirements, overall dimensions and other data on standard mills; general specifications, including details on a variety of attachments; parts lists of single and twin mill units, keyed to assembly drawings; and many illustrations of various types of rubber and plastic mills, from the smallest to the largest sizes. Also included are illustrations of refiners, washers, crackers and other processing units, plus views and a brief description of the company's process-testing laboratory.

•

E-S-E-N Retarder or Antiscorch for Processing Safety. (Compounding Research Report No. 10). Naugatuck Chemical Division, U. S. Rubber Co., Rockefeller Center, New York 20, N. Y. 8½ x 11 in. 8 pp.

The physical and compounding properties of E-S-E-N as a retarder or antiscorching agent are considered in this technical report. Facts as to processing safety are outlined. The use of E-S-E-N in non-black natural rubber compounds, in a carbon black loaded natural compound, and in synthetic rubbers is described and typical formulae given. Physical test data for these recipes are offered in tabular form.

•

Dillon Mechanical Pressure Gauge. W. C. Dillon & Co., Inc., 5410 W. Harrison St., Chicago 44, Ill. 8½ x 11 in. 4 pp.

Pertinent dimensions and features of the mechanical pressure gauge manufactured by the company are presented in this folder. With capacities ranging from 0 to 5,000 pounds, the use of the gauge in many different applications is illustrated. The different models, calibrated in pounds or kilograms, are also listed as to capacity, dial diameter and price.

•

Rust Ban. Esso Standard Oil Co., 15 West 51st St., New York 19, N. Y. 8½ x 11 in. 16 pp.

Detailed recommendations for the selection of rust preventives as well as other pertinent information on the use of these coatings are contained in this booklet. Typical physical properties of the plastic, fluid and solvent types of Rust Ban are presented, together with procedures for using the product. The booklet is illustrated with charts, engineering drawings and photographs.

PHILBLACK O PHILBLACK A PHILBLACK O PHILBLACK A PHILBLACK O
PHILBLACK A PHILBLACK O PHILBLACK A PHILBLACK O PHILBLACK A
Philistine?
SEE PAGE 124
PHILBLACK O PHILBLACK A PHILBLACK O PHILBLACK A PHILBLACK O

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By using our process liners you obtain production economies and benefits, because of the increased life of liners, decreased stock losses and improved separation of stock and liner.

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Di-Tert-Butyl-Para-Cresol: Effectiveness as a Rubber Antioxidant. (C-9-115-2). Chemical Division, Koppers Co., Inc., Pittsburgh 19, Penn. 6 pp. 8½ x 11 in.

Results of tests showing the effectiveness of di-tert-butyl-para-cresol (DBPC) as a non-staining, non-discoloring antioxidant for rubber is offered in this technical bulletin. Tests conducted by an independent testing organization compared DBPC with five commercially used non-staining, non-discoloring rubber antioxidants. The tests included determination of loss of tensile strength, change of elongation at break, and increase of weight as a result of aging the specimen in an oxygen bomb. Also tested were discoloration of the specimen as a result of exposure to ultraviolet light, and tendency of the aged specimen to cause staining.

•

Elmes Hydraulic Equipment for the Plastics Industry. (Bulletin No. 5200-A). Elmes Engineering Division of American Steel Foundries, 1150 Tennessee Avenue, Cincinnati 29, Ohio. 8½ x 11 in. 12 pp.

Molding, laboratory, and small production presses, together with accumulators, pumps, and other accessories used in plastics molding are illustrated and described in this bulletin. Schematic diagrams and specifications outline the characteristics of the unit under discussion. Press types, sizes, speeds, pressures, platen dimensions, kinds of controls, and arrangement of power are all carefully considered. Many photographs illustrate the text.

•

Case of the Metal that was Caught! (Bulletin 14B7217A). Allis-Chalmers Manufacturing Co., S. 70th St., Milwaukee, Wisc. 8½ x 11 in. 20 pp.

The design and operation of the company's new electronic metal detector are described in this bulletin. Identified as an electronic sentry designed to safeguard non-metallic products, the metal detector is being used in the rubber, plastics, paper, ceramic, confectionery and other industries. The bulletin discusses the manner in which the machine is built and how it works. Specifications and dimensions are offered in charts and engineering drawings. Photographs of metal detectors on the job are included.

•

Castaloy Laboratory Appliances. Fisher Scientific Co., 717 Forbes Street, Pittsburgh 19, Penna. 8½ x 11 in. 24 pp.

Among the different appliances discussed in this catalog are burette holders and supports, utility, versatile, extension and burette clamps, flexaframe supports and accessories, clamp holders, special holding clamps, special purpose supports, and devices for controlling flow. Each of the appliances is pictured and described as to dimensions, characteristics and use.

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Specify DAREX Copolymers in either powder or tablets. Conventional powder, the common form you are accustomed to using. Friable tablets, new to the rubber resin field, that eliminate dusting and permit clean salvage from broken bags. Make your choice at the same price.

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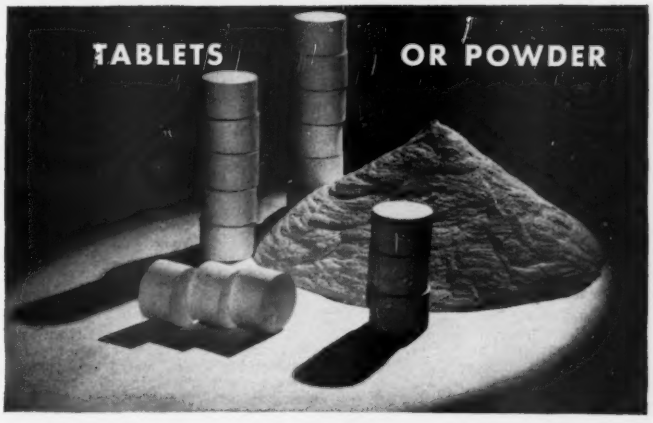

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Specialty type high styrene copolymer, superior for resilience and resistance to cutting and abrasion. Excellent dielectric characteristics, low water absorption, resists softening in C. V. cures.

DEWEY AND ALMY CHEMICAL COMPANY, CAMBRIDGE 40, MASS.

MARKETS

Rubber – Crude, Reclaimed and Scrap – Cotton – Ducks – Tire Fabrics – Sheetings

NEW YORK, NOV. 9, 1949

Natural Rubber

The price of spot rubber on the Commodity Exchange has swung in the rather small range of 50 points since our last report (October 13), high for the period being 16.62 cents reached on November 9, and low being 16.12 reached on October 26 and again on October 27. The average price of spot rubber for the month of October was 16.31 cents based upon 20 trading days. This compares with an average of 17.58 cents for the month of September.

An order for 8,000 to 10,000 tons of Indonesian rubber, much of it believed to be destined as raw material for factories in Western Germany, has been placed by the Economic Cooperation Administration. According to trade sources, some of the rubber will be turned over to the United States for stockpiling purposes, but most of it is intended for the use of Western European recipients of ECA funds, particularly Germany.

Strength in the primary markets can be directly attributed to improved Continental demand. Singapore has been enjoying a demand from Far Eastern areas, particularly Hong Kong. Any number in the trade see the possibility of a higher price for natural rubber in the near future. This is based on probable stockpile buying in the U. S., stockpiling by Canada, and a likely increase in consumer demand in the U. S.

Today's quotations on the outside market, London and Singapore, follow:

Outside Market

No. 1 Ribbed Smoked Sheets:	
Spot	.16¾
January-March	.16⅝
April-June	.16½
Thin Latex Crepe:	
Spot	.22⅜
November	.22¼
Thin Brown Crepe, No. 2	.14⅜
Ambers, No. 3	.14⅛
Flat Bark Crepe	.13¾

London Market

(Standard Smoked Sheets)

December	15.82 -	15.90
January-March	15.90 -	16.04

Singapore Market

(Standard Smoked Sheets)

November	14.84 -	14.87

Synthetic Rubber

(Dry Types-Per Pound)

Butaprene NF	.440 - .450
Butaprene NL	.450 - .460
Butaprene NAA	.490 - .500
Butaprene NXM	.520 - .530
Chemigum 30 N4NS	.400 - .470
Chemigum 50N4NS	.400 - .470
Chemigum N3	.450 - .520
GR-I	— - .185
GR-S	— - .185
Hycar OR-25	.450 - .460
Hycar OR-15	.520 - .530
Hycar OS-10	.500 - .510
Neoprene Types CG and AC	— - .500
Neoprene Type E	— - .650
Neoprene Types FR and KNR	— - .750
Neoprene Type GN	— - .320
Neoprene Type GN-A	— - .320
Neoprene Type RT	— - .350
Neoprene Type S	— - .320
Neoprene Type W	— - .350
Paracril 18	.430 - .450
Paracril 26	.440 - .460
Paracril 35	.510 - .530
Silastic (compounded)	2.35 - 4.40
Thiokol Type A	.370 - .470
Thiokol Type FA	.520 - .620
Thiokol PR-1	.750 - .850
Thiokol Type ST	.750 - .850

Scrap Rubber

The general condition of the scrap rubber market has brightened within the past few months. Demand for scrap rubber stocks has increased to higher levels than have been evidenced at any time during the year. The export market has also been experiencing an upward turn. Prices for scrap rubber, adjusted last month, are now expected to hold for some time. Current quotations follow:

Mixed passenger tires	ton	$13.00
Beadless truck tires	ton	nom.
Mixed truck tires	ton	14.00
Beadless passenger tires	ton	nom.
No. 1 passenger peelings	ton	42.50
No. 1 truck peelings	ton	42.50
Red passenger tubes	lb.	.07
Black passenger tubes	lb.	.04
Mixed passenger tubes	lb.	.04
No. 2 truck tubes	lb.	nom.
Red truck tubes	lb.	.07
Black truck tubes	lb.	.03¾
Buffings	ton	15.00

Reclaimed Rubber

Consumption of reclaim for the month of September is estimated at 18,412 tons by the Department of Commerce. This compares with a consumption of 19,297 tons for the month of August. There has been some reduction in the demand for reclaim due, in part, to manufacturing slowdowns caused by the steel strike. While demand has leveled off, however, the general reclaim picture is satisfactory. Prices have not been adjusted. Current quotations follow:

Tires		
Black, Digester (Natural)	lb.	.08¼ - .08¾
Peels No. 1	lb.	.08¼ - .08¾
Whole Tire (Blend)	lb.	.08¼ - .08¾
Inner Tubes		
Black (Natural)	lb.	.11½ - .12
Red (Natural)	lb.	.13½ - .14½
Butyl	lb.	.08¼ - .08¾
Shoe		
Unwashed (Natural)	lb.	.08¾ - .09¼

Cotton Tire Fabrics

Transitional phases in the changeover from cotton cords to rayon and nylon continue to disrupt the cotton tire fabric market. While other types of yarns and fabrics have been generally experiencing a rising trend, the tire fabric market holds to the low levels maintained for the past several months. There have been no price changes during the past period. Current quotations follow:

Standard, Peeler, 12/4/2	lb.	.68
Standard, Peeler, 14/4/2	lb.	.70
Standard, Peeler, 16/4/3	lb.	.7250
Extra Staple, Peeler, 12/4/2	lb.	.8315
Extra Staple, Peeler, 14/4/2	lb.	.8575
Extra Staple, Peeler, 16/4/3	lb.	.8825

Chafers

14.4 oz. (per sq. yard)	lb.	.67
9.25 oz. (per sq. yard)	lb.	.6325
11.65 oz. (per sq. yard)	lb.	.60
8.9 oz. (per sq. yard)	lb.	.6475

Cotton

The price of middling uplands on the Cotton Exchange has swung in the relatively small range of 50 points since our last report (October 13), high for the period being 30.72 cents reached on November 4, and low for the period being 30.22 on October 17. The average price of middling uplands for the month of October was 30.32 cents based upon 25 trading days. This compares with an average of 30.94 cents for the month of September.

A cotton crop of 15,524,000 bales, the largest since 1937 and the seventh largest of record, was forecast by the Department of Agriculture in its next-to-the-last production report of this year. The estimate is 78,000 bales above the forecast of a month ago. It compares with 14,868,000 bales produced last year and an average of 11,306,000 for the ten years 1938-47.

Exports of cotton during the coming year will depend on Marshall Plan funds. United States exports of raw cotton in 1949-50 probably will be as dependent on ECA funds as in 1948-49, the Bureau of Agricultural Economics reports. In the 1948-49 period, 60% of the total exports of 4,743,000 bales were financed by this means.

Japanese consumption of cotton and the exportation of cotton goods are expected to increase as a result of a more liberal sales policy adopted and a new sterling agreement. Tokyo reports indicate that cotton textile exports will be restored to private hands in December and that the fixed policy formerly followed by SCAP will be abandoned at that time.

Quotations for middling uplands on the Exchange follow:

	Oct. 13	November 9		
	Close	High	Low	Close
December	29.65	30.07	30.04	30.07
March	29.60	30.06	30.02	30.06
May	29.52	29.97	29.93	29.97

Closing Rubber Prices on New York Commodity Exchange

No. 1 R.S.S. Contract)

FROM OCTOBER 14 TO NOVEMBER 9

Date Oct.	Spot	Dec.	Mar.	May	July	Sales
14	16.25	16.00	15.85	15.60	15.40	55
15	—	—	—	—	—	—
16	—	—	—	—	—	—
17	16.25	16.04	15.86	15.60	15.40	35
18	16.25	16.30	16.08	15.85	15.65	80
19	16.38	16.30	16.10	15.85	15.65	73
20	16.38	16.30	16.07	15.90	15.70	73
21	16.38	16.35	16.08	15.88	15.68	55
22	—	—	—	—	—	—
23	—	—	—	—	—	—
24	16.38	16.10	15.80	15.55	15.35	20
25	16.25	16.05	15.77	15.55	15.35	81
26	16.12	16.08	15.87	15.67	15.50	87
27	16.12	16.30	16.10	15.95	15.75	118
28	16.38	16.35	16.15	15.95	15.75	156
29	—	—	—	—	—	—
30	—	—	—	—	—	—
31	16.38	16.54	16.30	16.20	16.00	118
Nov.						
1	16.50	16.50	16.25	16.02	15.86	48
2	16.38	16.61	16.40	16.20	16.00	128
3	16.38	16.55	16.35	16.12	16.05	100
4	16.50	16.45	16.35	16.20	16.00	293
5	—	—	—	—	—	—
6	—	—	—	—	—	—
7	16.50	16.75	16.50	16.30	16.17	31
8	—	—	—	—	—	—
9	16.62	16.75	16.55	16.32	16.19	48

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STATISTICS *Of Interest to the Rubber Industry*

U. S. Imports and Re-Exports of Natural Rubber

	GROSS IMPORTS										RE-EXPORTS		TOTAL NET IMPORTS
	Natural Rubber (Dry)			Natural Rubber (Latex)			Guayule			Total Gross Imports			
Year	Long Tons	Total Declared Value	Average Declared Value per pound Cents	Long Tons	Total Declared Value	Average Declared Value per pound Cents	Long Tons	Total Declared Value	Average Declared Value per pound Cents	Long Tons	Long Tons	Total Declared Value	Long Tons
1936	467,064	152,072,496	14.54	19,852	6,659,899	14.98	1,229	286,552	10.41	488,145	12,581	4,488,223	475,564
1937	574,600	237,307,041	18.44	21,185	10,213,670	19.67	2,694	745,873	12.36	600,479	7,902	3,885,433	592,577
1938	397,620	125,357,730	14.07	11,878	4,147,318	15.59	2,485	623,819	11.21	411,983	5,652	1,799,124	406,331
1939	469,803	167,558,245	15.92	27,438	10,467,552	17.03	2,232	463,345	9.27	499,473	13,125	5,832,618	486,348
1940	780,820	303,117,726	17.33	33,789	14,593,466	19.28	3,634	758,087	9.31	818,243	7,060	3,197,136	811,183
1941	989,329	401,890,393	18.14	34,798	15,965,627	20.48	4,881	1,145,767	10.48	1,029,008	5,376	2,757,872	1,023,632
1942	265,980	112,377,896	18.86	10,646	5,630,667	23.61	5,523	1,660,792	13.42	282,149	10,856	5,913,386	271,293
1943	50,348	31,364,033	27.81	1,890	1,312,202	30.99	7,679	3,636,789	21.14	59,917	22,587	16,446,707	37,330
1944	103,820	73,908,389	31.78	3,091	2,092,211	30.22	6,700	3,351,233	22.33	113,611	9,739	8,712,695	103,872
1945	134,454	95,850,441	31.82	4,773	3,115,853	29.14	10,040	5,963,797	26.52	149,267	9,509	7,201,746	139,758
1946	366,415	222,552,939	27.12	8,421	5,843,085	30.98	5,344	2,859,246	23.89	380,180	7,711	5,331,954	372,469
1947	690,954	306,919,456	19.83	17,722	9,820,080	24.91	2,880	1,492,825	20.30	711,556	4,122	2,354,494	707,434
1948	702,293	290,849,177	18.49	32,762	18,288,223	24.92	302	71,330	10.53	735,357	6,672	3,259,324	728,685
1948:													
Jan.	76,723	29,782,199	17.33	4,130	2,044,850	22.11	....	.....	....	117,906	334	206,103	117,572
Feb.	51,528	21,027,604	18.06	2,400	1,420,676	26.43	43	10,235	10.53	53,971	290	170,339	53,681
Mar.	68,848	27,902,550	18.09	3,148	1,730,014	24.02	25	6,845	10.05	72,021	467	215,156	71,554
Apr.	38,433	15,136,536	17.35	2,284	1,260,932	24.65	30	7,076	10.53	40,747	343	190,815	40,404
May	37,227	14,409,747	17.28	3,442	1,915,744	24.84	40	9,435	10.53	40,709	1,031	485,941	39,678
June	62,376	25,338,739	18.13	2,288	1,335,173	26.05	60	14,152	10.53	64,724	718	348,043	64,006
July	60,070	25,206,980	18.07	3,654	2,002,902	24.48	100	23,587	10.53	63,734	466	243,756	63,268
Aug.	65,736	26,975,557	18.33	2,395	1,389,495	25.81	....	.....	....	67,771	520	268,912	67,251
Sept.	49,119	21,480,244	19.52	1,434	813,347	25.24	....	.....	....	50,553	514	229,016	50,039
Oct.	58,300	26,161,356	20.03	2,728	1,574,419	25.83	....	.....	....	61,028	675	320,570	60,353
Nov.	49,800	22,292,055	19.98	813	466,095	25.59	....	.....	....	50,613	772	349,315	49,841
Dec.	83,419	35,495,327	19.00	4,216	2,366,959	24.75	....	.....	....	87,635	569	250,540	87,066
1949:													
Jan.	66,575	27,037,698	18.13	1,132	634,165	25.02	....	.....	....	67,707	757	320,036	66,950
Feb.	55,234	21,549,791	17.41	2,159	1,030,107	21.30	....	.....	....	57,393	434	211,323	56,959
Mar.	53,768	20,095,422	16.68	2,809	1,564,383	24.87	....	.....	....	56,577	562	245,780	56,015
Apr.	48,262	18,167,840	16.85	2,271	1,219,404	23.97	....	.....	....	50,533	315	165,632	50,218
May	51,243	18,827,018	16.40	2,191	1,105,887	22.54	....	.....	....	53,434	390	181,457	53,044
June	49,038	18,084,566	16.47	2,180	1,113,169	22.80	....	.....	....	51,218	471	226,882	50,747
July	43,474	15,502,688	15.76	2,267	1,146,784	22.59	....	.....	....	45,741	699	289,896	45,042
Aug.	46,853	15,828,526	15.08	2,725	1,342,109	21.98	....	.....	....	49,578	251	110,368	49,327

Source: U. S. Department of Commerce.
Notes: (1) Figures for latex are on a dry weight basis. (2) Figures for re-exports include natural rubber (dry and latex) and guayule.

Natural Rubber
(Including Latex and Guayule)

(All Quantities in Long Tons)

Year	New Supply	Consumption	Re-Exports	Stocks On Hand at End of Period
1936	488,145	575,000	12,581	223,000
1937	600,479	543,600	7,902	262,204
1938	411,983	437,031	5,652	231,500
1939	499,473	592,000	13,125	125,800
1940	818,243	648,500	7,060	288,864
1941	1,029,007	775,000	5,376	533,344
1942	282,653	376,791	10,856	422,714
1943	55,329	317,634	20,815	139,594
1944	107,834	144,113	9,665	93,650
1945	135,672	105,429	6,743	118,715
1946	400,687	277,597	4,338	237,467
1947	688,354	562,661	4,101	129,038
1948	735,227	627,332	6,673	141,541
1947:				
Dec.	71,414	56,284	371	129,038
1948:				
Jan.	80,564	58,174	334	136,227
Feb.	54,418	51,012	290	148,081
Mar.	72,070	54,444	467	130,295
Apr.	40,947	50,616	343	123,248
May	40,709	52,022	1,031	112,724
June	64,725	55,701	718	119,818
July	63,775	48,769	466	128,446
Aug.	68,131	53,366	520	129,622
Sept.	50,556	52,131	514	123,912
Oct.	61,027	49,617	675	118,187
Nov.	50,671	51,632	746	113,251
Dec.	87,634	45,985	569	141,541
1949:				
Jan.	67,706	50,188	757	125,050
Feb.	57,401	46,285	434	118,803
Mar.	56,577	53,108	562	117,664
Apr.	50,533	47,859	315	112,916
May	53,510	46,128	390	111,875
June	51,218	47,117	471	103,626
July	46,277	40,597	699	103,017
Aug.	49,579	45,307	251	99,850
Sept.	.....	43,372	...	99,815

Source: 1936-40, U. S. Department of Commerce; 1941 to date, Rubber Division, OMD, and Predecessor Agencies.

U.S. Gross Imports of Balata, Jelutong, Gutta-Percha, etc.

(All Quantities in Long Tons)

	Balata		Jelutong		Gutta-Percha & Other Guttas	
Year	Tons	Value	Tons	Value	Tons	Value
1936	535	199,368	6,163	1,296,364	1,568	555,643
1937	354	151,344	7,109	2,017,786	1,122	440,894
1938	509	181,140	9,132	2,944,504	444	204,582
1939	694	265,553	6,640	1,603,418	1,740	539,255
1940	648	300,500	7,451	2,449,137	2,340	1,004,885
1941	924	489,514	8,821	2,954,001	1,783	607,025
1942	1,544	1,107,059	1,200	530,296	804	525,763
1943	1,047	708,701	35	14,840	....	.....
1944	1,012	660,805	88	45,578	10	4,999
1945	1,361	907,253	....	.....	36	21,970
1946	2,281	2,233,065	304	256,169	423	458,064
1947	1,982	2,276,531	2,878	1,496,887	392	779,591
1948	1,195	805,078	3,401	2,377,765	423	542,788
1948:						
Jan.	56	35,973	481	289,506	69	94,854
Feb.	145	90,023	307	209,015	66	84,839
Mar.	283	189,933	436	271,314	51	101,691
Apr.	82	36,570	651	393,280	52	68,166
May	45	36,109	512	314,432	24	54,191
June	67	36,885	277	211,373	45	41,277
July	120	87,327	205	170,949	15	35,001
Aug.	59	50,511	112	107,431	53	39,607
Sept.	91	67,970	112	83,432	0	0
Oct.	83	67,726	145	181,424	0	0
Nov.	86	49,155	48	36,634	20	10,572
Dec.	83	56,896	106	108,975	24	12,324
1949:						
Jan.	46	29,922	91	93,738	19	11,934
Feb.	65	53,665	77	91,362	9	16,328
Mar.	136	86,499	60	52,313	5	30,967
Apr.	88	48,244	14	8,753	16	9,878
May	103	60,361	85	83,291	...	.....
June	44	20,821	74	47,515	27	16,292
July	164	78,112	46	37,403	5	3,391
Aug.	137	66,002	114	96,509	5	2,218

Source: U. S. Department of Commerce.

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Synthetic Rubber—Totals

(GR-S, Neoprene, Butyl, and Buna N Types)

(All Quantities in Long Tons)

Year	Production	Imports	Consumption	Exports	Stocks On Hand at End of Period
1941	8,383	.....	6,259	572	1,702
1942	22,434	.....	17,651	1,419	4,612
1943	231,722	.....	170,891	18,148	41,568
1944	762,630	11,043	566,670	104,266	142,927
1945	820,373	10,407	693,580	83,778	203,454
1946	740,026	7,709	761,699*	72,920	114,963
1947	508,702	1,093	559,566	11,385	62,366
1948	488,343	15,671	442,072	4,874	115,111
1948:					
Oct.	41,419	2,014	38,367	451	102,842
Nov.	40,779	1,988	37,690	366	107,297
Dec.	42,133	1,450	35,446	475	115,111
1949:					
Jan.	38,890	927	36,765	623	118,357
Feb.	36,103	1,170	34,611	335	118,932
Mar.	36,063	1,436	38,746	963	116,843
Apr.	35,445	881	36,454	506	114,944
May	32,335	1,402	35,267	619	112,739
June	31,953	1,127	36,949	513	106,813
July	34,270	1,689	30,014	614	113,595
Aug.	33,885	1,745	35,630	369	111,333
Sept.	30,878	....	32,131	....	110,919

Source: Rubber Division, OMD, and Predecessor Agencies.
Notes: (1) These figures are revised from time to time and the latest available issue should be consulted for the most accurate data. (2) Figures shown include the output of both government and privately-owned plants. (3) Figures for 1941 are estimated. * Includes year-end adjustment of 5,384 tons to cover non-reporting companies.

Synthetic Rubber—By Type

(All Quantities in Long Tons)

New Supply

	GR-S (Buna S)	GR-M (Neoprene)	GR-I (Butyl)	Buna N Types	Total
1942	3,721	8,956	23	9,734	22,434
1943	182,259	33,603	1,373	14,487	231,722
1944	679,949	56,660	20,252	16,812	773,673
1945	724,859	45,672	52,378	7,871	830,780
1946	613,408	47,766	80,823	5,738	747,735
1947	408,858	31,495	62,824	6,618	509,795
1948	405,492	34,848	56,662	7,012	504,014

Consumption

1942	2,579	6,833	22	8,217	17,651
1943	131,977	26,205	304	12,405	170,891
1944	495,552	46,243	10,763	14,112	566,670
1945	600,145	42,394	43,012	8,029	693,580
1946	632,126	44,357	79,228	5,988	761,699
1947	448,589	37,703	68,838	4,536	559,666
1948	345,313	32,118	58,870	5,771	442,072

Exports

1942	222	1,037	..	160	1,419
1943	14,937	2,540	46	631	18,148
1944	98,380	4,799	530	557	104,266
1945	76,555	5,837	980	406	83,778
1946	68,763	2,642	495	797	72,697
1947	7,951	2,617	62	755	11,385
1948	1,093	2,875	21	885	4,874

Stocks at End of Period

1942	1,050	1,786	4	1,772	4,612
1943	30,975	6,415	1,033	3,145	41,568
1944	116,130	11,739	9,892	5,166	142,927
1945	170,571	9,703	18,378	4,802	203,454
1946	81,483	10,470	19,478	3,755	115,186
1947	40,606	5,237	13,184	3,339	62,366
1948	96,282	5,072	10,995	2,762	115,111

Source: Rubber Division, OMD, and Predecessor Agencies.
Notes: (1) These figures are revised from time to time and the latest available issue should be consulted for the most accurate data. (2) Figures for GR-M and Buna N Types include production of privately-owned plants.

Gasoline Consumption

(In Thousands of Barrels of 42 Gallons)

	1942	1943	1944	1945	1946	1947	1948	1949
Jan.	49,216	36,085	47,540	52,008	51,746	57,057	61,308	63,083
Feb.	42,666	36,274	47,754	48,856	47,654	50,551	56,487	57,934
Mar.	50,820	41,586	52,263	55,364	56,703	59,947	68,171	73,118
Apr.	49,554	48,177	50,005	59,024	62,111	64,140	72,183	75,279
May	53,212	49,828	54,230	60,748	66,800	70,865	77,186	81,622
June	50,077	53,325	54,266	60,580	63,247	71,329	78,044	83,338
July	54,606	49,867	55,119	66,170	60,076	73,441	81,428	82,118
Aug.	48,793	51,880	55,618	70,058	66,729	72,089	80,351	84,632
Sept.	50,093	49,707	56,318	64,529	62,268	71,384	76,159	.....
Oct.	50,094	53,111	53,154	55,708	66,637	73,277	75,164	.....
Nov.	50,729	50,703	54,967	53,543	61,345	64,158	72,560	.....
Dec.	39,250	48,695	52,250	49,745	61,101	67,506	72,162	.....
Total	589,110	568,238	633,482	696,333	735,417	795,015	871,200	.....

Source: U. S. Bureau of Mines

Reclaimed Rubber

(Including Natural and Synthetic)

(All Quantities in Long Tons)

Year	Production	Consumption Tons	Consumption % to Crude	Exports	Stocks On Hand at End of Period
1936	150,571	141,486	24.6	7,085	19,000
1937	185,033	162,000	29.8	13,233	28,800
1938	122,400	120,800	27.6	7,403	23,000
1939	186,000	170,000	28.7	12,611	25,250
1940	208,971	190,244	29.3	11,347	32,636
1941	274,202	251,231	32.2	13,851	41,750
1942	286,007[b]	254,820	64.6	30,405	42,532
1943	304,058[c]	291,082	59.6	15,678	46,201
1944	260,631[d]	251,083	35.3	11,800	43,832
1945	243,309	241,036	30.2	13,413	28,155
1946	295,612	275,410	26.5	14,461	33,666
1947	291,395	288,395	24.8	14,556	35,943
1948	266,861	261,113	24.4	11,428	32,630
1948:					
July	17,712	19,291	23.2	712	34,302
Aug.	20,255	22,917	24.7	643	32,025
Sept.	21,805	23,478	25.7	740	30,198
Oct.	23,859	23,512	26.7	848	31,879
Nov.	**23,050**	**22,170**	**24.8**	**1,210**	**33,378**
Dec.	**21,396**	**20,122**	**24.9**	**900**	**34,702**
1949:					
Jan.	19,741	19,031	21.9	991	32,868
Feb.	18,270	17,712	21.9	1,012	32,738
Mar.	19,991	19,508	21.2	1,054	33,397
Apr.	18,463	18,649	22.1	1,070	32,825
May	18,184	18,323	22.5	887	32,326
June	18,849	19,316	23.0	694	30,684
July	14,626	15,966	22.6	681	29,126
Aug.	17,813	19,297	24.2	612	27,526
Sept.	18,300	18,412	24.3	....	26,224

Source: 1936-40, Department of Commerce; 1941 to date, Rubber Division, OMD, and Predecessor Agencies.
Notes: (1) These figures are revised from time to time and the latest available issue should be consulted for the most accurate data. (a) Includes natural and synthetic rubber. (b) Includes 893 tons of imports. (c) Includes 67 tons of imports. (d) Includes 21 tons of imports.

Automobile Production in U. S.

(Civilian Production Only)

Year	Passenger Cars	Trucks	Total	Year	Passenger Cars	Trucks	Total
1930	2,784,745	571,241	3,355,986				
1931	1,973,090	416,648	2,389,738	1940	3,692,328	721,637	4,413,965
1932	1,135,491	235,187	1,370,678	1941	3,744,500	875,381	4,619,681
1933	1,573,512	346,545	1,920,057	1942	220,814	133,083	353,897
1934	2,177,919	575,192	2,753,111	1943	0	4,501	4,501
1935	3,252,244	694,690	3,946,934	1944	0	124,819	124,819
1936	3,669,528	781,862	4,451,390	1945	83,792	313,643	397,435
1937	3,915,889	892,382	4,808,271	1946	2,148,699	930,760	3,079,459
1938	2,000,985	485,852	2,486,837	1947	3,558,178	1,220,634	4,778,812
1939	2,866,796	704,308	3,571,104	**1948**	**3,909,270**	**1,363,856**	**5,273,126**
1948:							
Jan.	305,081	99,200	404,281	July	356,764	116,780	473,544
Feb.	274,847	107,054	381,901	Aug.	348,782	111,760	460,542
Mar.	349,998	140,606	490,604	Sept.	301,170	111,224	412,394
Apr.	308,071	128,963	437,034	Oct.	383,756	107,352	491,108
May	**225,461**	**111,789**	**337,250**	**Nov.**	**364,440**	**103,837**	**468,277**
June	**312,406**	**117,572**	**429,978**	**Dec.**	**378,455**	**107,702**	**486,157**
1949:							
Jan.	326,019	104,599	430,618	July	483,261	95,348	578,609
Feb.	324,547	101,700	426,247	Aug.	557,370	99,850	657,220
Mar.	402,402	115,171	517,573	Sept.	534,493	91,389	625,882
Apr.	436,392	106,212	542,604	Oct.	.....	.....	.....
May	394,703	86,200	480,903	Nov.	.....	.....	.....
June	493,882	99,126	593,008	Dec.	.....	.....	.....

Source: Automobile Manufacturers Association.
Note: Figures are based on factory sales. Revisions are made from time to time in these figures and the latest issue should be consulted for accuracy.

Rim Production

	1944	1945	1946	1947	1948
Passenger Car	1,748,917	4,504,368	15,058,469	21,346,004	23,842,796
Truck & Bus	6,391,441	6,386,652	5,939,244	7,737,353	6,920,231
Agricultural	597,301	1,441,909	1,735,992	2,633,699	3,140,882
Earth Mover	703	1,308	5,520	10,610	13,330
Total	**9,138,362**	**12,434,237**	**22,739,225**	**31,727,666**	**33,917,239**

	1949					
	Apr.	May	June	July	Aug.	Sept.
Passenger Car	2,276,658	2,337,844	2,660,576	2,260,020	3,023,981	3,014,872
Truck & Bus	362,643	359,700	293,872	344,984	310,351	293,933
Agricultural	242,123	205,805	216,695	154,913	233,734	207,691
Earth Mover	478	1,055	1,157	964	531	353
Total	2,881,902	2,904,404	3,172,300	2,760,881	3,568,597	3,516,849

Source: The Tire & Rim Association, Inc.

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Automotive Pneumatic Casings

(Thousands of Units)

	Shipments					
	Original Equipment	Replacement	Export	Total	Production	Inventory End of Period
1937 (total)	22,353	29,886	1,246	53,485	53,310	10,383
Passenger Car	20,055	26,177	696	46,928	46,497	8,745
Truck and Bus	2,298	3,709	550	6,557	6,813	1,638
1938 (total)	11,516	30,567	1,049	43,132	40,907	8,451
Passenger Car	10,086	27,104	580	37,770	35,789	6,937
Truck and Bus	1,430	3,463	469	5,362	5,118	1,514
1939 (total)	18,208	38,022	1,279	57,509	57,613	8,665
Passenger Car	15,742	33,471	607	49,820	49,933	7,108
Truck and Bus	2,466	4,551	672	7,689	7,680	1,557
1940 (total)	22,252	35,346	1,176	58,774	59,186	9,127
Passenger Car	19,560	30,903	411	50,874	50,965	7,270
Truck and Bus	2,692	4,443	765	7,900	8,221	1,857
1941 (total)	24,780	39,895	1,489	66,164	61,540	4,436
Passenger Car	19,855	34,119	586	54,560	50,392	3,165
Truck and Bus	4,925	5,776	903	11,604	11,148	1,271
1942 (total)	6,680	8,872	207	15,759	15,351	6,247
Passenger Car	910	2,734	38	3,682	2,790	4,432
Truck and Bus	5,770	6,138	169	12,077	12,561	1,815
1943 (total)	6,128	18,547	225	24,900	20,423	1,883
Passenger Car	82	10,606	71	10,759	7,620	1,132
Truck and Bus	6,046	7,941	154	14,141	12,803	751
1944 (total)	6,654	26,439	263	33,356	33,446	2,013
Passenger Car	208	18,330	130	18,668	18,819	1,218
Truck and Bus	6,446	8,109	133	14,688	14,627	795
1945 (total)	5,984	36,479	504	42,967	44,524	3,077
Passenger Car	1,115	25,463	222	26,800	28,200	2,214
Truck and Bus	4,869	11,016	282	16,167	16,324	863
1946 (total)	15,310	65,490	1,512	82,312	82,298	2,448
Passenger Car	11,086	54,684	653	66,423	66,466	1,763
Truck and Bus	4,224	10,806	859	15,889	15,832	685
1947 (total)	25,056	62,871	3,256	91,183	95,550	6,949
Passenger Car	19,644	52,857	1,608	74,109	77,795	5,444
Truck and Bus	5,412	10,014	1,648	17,074	17,755	1,505
1948 (total)	26,845	49,148	1,787	77,781	81,314	10,698
Passenger Car	21,589	41,295	656	63,540	66,738	8,773
Truck and Bus	5,256	7,853	1,132	14,241	14,576	1,925
1949:						
May (total)	2,380	4,324	120	6,824	6,934	13,301
Passenger Car	2,103	3,764	41	5,909	5,981	10,769
Truck and Bus	277	559	79	915	953	2,532
June (total)	3,234	4,185	116	7,535	7,391	13,134
Passenger Car	2,928	3,635	36	6,599	6,471	10,618
Truck and Bus	307	550	80	937	921	2,515
July (total)	3,098	4,488	108	7,694	6,264	11,717
Passenger Car	2,803	3,958	35	6,795	5,507	9,336
Truck and Bus	295	530	73	898	756	2,381
Aug. (total)	3,191	4,463	115	7,768	6,228	9,970
Passenger Car	2,933	3,807	40	6,780	5,538	7,926
Truck and Bus	258	655	75	988	690	2,044

Source: The Rubber Manufacturers Association, Inc.

Cotton, Rayon and Nylon Tire Fabrics

(Production in Thousands of Pounds)

	Cotton				Rayon and Nylon [b]		
	Tire Cord Not Woven	Cord Fabric Woven	Chafer and All Other Tire Fabrics	Total	Tire Cord Not Woven	Tire Cord And Other Tire Fabrics	Total
1946:							
Jan.-Mar.	17,128	39,377	15,245	71,750	a	51,208	51,208
Apr.-June	19,622	40,197	18,623	78,442	a	52,511	52,511
July-Sept.	17,279	39,259	18,787	75,325	5,102	46,932	52,034
Oct.-Dec.	20,660	42,668	21,708	85,036	5,858	50,589	56,447
Total	74,689	161,501	74,363	310,553	10,960	201,240	212,200
1947:							
Jan.-Mar.	21,972	49,377	21,815	93,164	5,322	52,059	57,381
Apr.-June	23,491	53,746	16,480	93,717	5,486	47,360	52,846
July-Sept.	15,571	44,291	14,596	74,458	6,161	51,719	57,880
Oct.-Dec.	18,183	48,532	17,762	84,477	6,550	55,078	61,628
Total	79,217	195,946	70,653	345,816	23,519	206,216	229,735
1948:							
Jan.-Mar.	18,546	50,251	19,391	88,188	a	60,569	60,569
Apr.-June	15,585	45,385	18,213	79,183	a	59,759	59,759
July-Sept.	29,743	45,927	c	75,670	a	63,642	63,642
Oct.-Dec.	13,321	34,424	15,879	63,624	a	65,258	65,258
Total	77,195	175,987	53,483	306,665	.....	249,228	249,228
1949:							
Jan.-Mar.	d	33,213	25,395	56,608	a	68,296	68,926
Apr.-June	d	29,114	18,926	48,040	a	68,269	68,269
July-Sept.	.....	.....	.....	.....	.....	.....	.....
Oct.-Dec.	.....	.....	.....	.....	.....	.....	.....
Total	.....	.....	.....	.....	.....	.....	.....

Source: U. S. Bureau of the Census.

Notes: (a) Included with tire cord and fabrics to avoid disclosures of operations of individual mills. (b) Fuel cell fabrics are not included with rayon and nylon tire cord and fabrics. (c) Included with tire cord not woven. (d) Included with chafer and all other tire fabrics.

Automotive Inner Tubes

(Thousands of Units)

	Shipments					
	Original Equipment	Replacement	Export	Total	Production	Inventory End of Period
1936	21,514	32,188	721	54,423	57,036	10,945
1937	22,464	29,554	749	52,767	52,373	10,312
1938	11,515	28,134	644	40,293	37,848	8,166
1939	18,190	31,998	1,002	51,190	50,649	7,036
1940	22,172	29,070	972	52,214	52,237	7,017
1941	24,722	33,749	1,232	59,703	57,433	4,686
1942	6,895	7,213	159	14,267	12,685	6,206
1943	6,350	12,474	189	19,014	15,014	2,626
1944	6,460	20,569	196	27,224	27,488	2,813
1945	5,988	33,906	411	40,304	41,742	3,627
1946	15,327	59,357	1,424	76,108	77,251	3,820
1947	25,046	46,560	2,483	74,088	79,181	8,059
1948	26,839	40,494	1,125	68,457	70,150	9,734
1949:						
Jan.	2,298	2,531	97	4,926	5,062	9,815
Feb.	2,168	2,160	76	4,404	4,922	10,442
Mar.	2,513	2,565	95	5,174	5,948	11,231
Apr.	2,767	2,552	78	5,396	6,059	11,748
May	2,380	2,830	87	5,296	6,088	12,410
June	3,231	3,106	72	6,409	6,430	12,466
July	3,107	3,127	64	6,230	5,230	11,364
Aug.	3,190	3,351	61	6,603	5,169	9,858

Source: The Rubber Manufacturers Association, Inc.

Smoked Sheets—Spot Closing Prices

(New York Market—Cents per pound)

Year	High	Low	Avg.	Year	High	Low	Avg.
1910	288	141	206.60	1930	16½	7½	11.98
1911	184	114	141.30	1931	8¾	4½	6.17
1912	140	108	121.60	1932	4¾	2½	3.49
1913	113	59	82.04	1933	9¾	2¾	5.96
1914	93	56	65.33	1934	15⅜	8¼	12.92
1915	79	58½	65.85	1935	13¾	10½	12.37
1916	102	55	72.50	1936	23	13½	16.41
1917	90	52	72.23	1937	26⅜	14	19.39
1918	70	40	60.15	1938	17⅞	10¼	14.64
1919	57	38½	48.70	1939	24	14⅜	17.57
1920	56½	16	36.30	1940	24	18¼	20.10
1921	21¼	11½	16.36	1941	24⅜	19½	22.40
1922	28¾	13¾	17.50	1942	22½	22½	22.50
1923	37½	24¾	29.45	1943	22½	22½	22.50
1924	40⅝	17¾	26.20	1944	22½	22½	22.50
1925	121	34¾	72.46	1945	22½	22½	22.50
1926	88½	36¾	48.50	1946	22½	22½	22.50
1927	41¾	33	37.72	1947	25	14	20.00
1928	41¾	17	22.48	1948	25	18	21.99
1929	26⅞	15½	20.55				

Note: Price was fixed by Government on August 6, 1941, at 22½c a pound for non-war uses. Free trading was resumed May 1, 1947.

Spot Closing Cotton Prices

(Middling Upland Grade—New York Market—in Cents)

Average Monthly Price Per Pound

	1942	1943	1944	1945	1946	1947	1948	1949
Jan.	19.85	21.34	20.76	22.36	25.49	32.58	36.09	33.37
Feb.	20.05	21.61	21.34	22.29	26.57	33.91	33.63	33.41
Mar.	20.42	21.98	21.65	22.43	27.52	35.89	35.04	33.44
Apr.	21.10	22.02	21.71	21.88	28.40	35.89	38.10	33.84
May	20.88	21.97	21.63	23.30	28.17	36.31	38.57	33.73
June	19.78	21.92	23.31	23.42	29.89	37.83	38.12	33.56
July	20.27	21.46	22.33	23.27	34.11	38.03	34.89	32.99
Aug.	19.45	21.09	22.11	23.10	36.31	34.83	32.23	32.06
Sept.	19.62	21.10	22.10	23.25	37.59	32.21	31.92	30.94
Oct.	19.79	21.00	22.32	23.85	36.79	32.39	32.01	30.32
Nov.	20.21	20.32	22.13	24.71	31.50	34.50	32.15	....
Dec.	20.55	20.32	22.28	25.21	33.03	36.74	32.90	....
Average for Year	20.16	21.34	21.89	23.25	31.28	35.11	34.64	....

Consumption of Vinyl Resins

(In Thousands of Pounds)

	Sheeting and Film [a]	Textile and Paper Coating Resins [b]	Molding and Extrusion Materials [b]	All Other [b, c]
1946	52,080	11,673	61,852	27,083
1947	66,430	17,237	73,114	27,064
1948	98,021	31,085	73,598	21,147
1948:				
Dec.	8,761	2,472	7,068	1,808
1949:				
Jan.	10,197	2,847	6,834	2,589
Feb.	9,368	1,979	5,569	2,148
Mar.	11,787	2,384	5,660	2,387
Apr.	13,600	2,489	4,775	1,694
May	10,986	2,212	4,817	1,406
June	10,827	2,177	5,592	1,136
July	10,020	1,901	5,560	994
Aug.	12,849	2,125	6,330	816

Source: Bureau of the Census.

Notes: (a) Includes weight of fillers, plasticizers, extenders and safety glass sheeting; (b) Resin content; (c) Includes Adhesives, but excludes data for protective coating resins.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912, AS AMENDED BY THE ACTS OF MARCH 3, 1933, AND JULY 2, 1946, of THE RUBBER AGE, published monthly at East Stroudsburg, Pa., for October, 1949.

State of New York }
County of New York } ss.

Before me, a notary public in and for the state and county aforesaid, personally appeared Peter P. Pinto, who, having been duly sworn according to law, deposes and says that he is the Business Manager of The Rubber Age and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, as amended by the Acts of March 3, 1933, and July 2, 1946 (Section 537, Postal Laws and Regulations), to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:

Publisher, Palmerton Publishing Company, Inc., 250 W. 57th St., New York 19, N. Y.; Editor, M. E. Lerner, 250 W. 57th St., New York 19, N. Y.; Managing Editor, None; Business Manager, Peter P. Pinto, 250 W. 57th St., New York 19, N. Y.

2. That the owner is (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given):

Palmerton Publishing Company, Inc., 250 W. 57th St., New York 19, N. Y.; P. L. Palmerton, 250 W. 57th St., New York 19, N. Y.; Earl D. Osborn, 40 E. 36th St., New York 16, N. Y.; Peter P. Pinto, 250 W. 57th St., New York 19, N. Y.; M. E. Lerner, 250 W. 57th St., New York 19, N. Y.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are:

None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholders or security holders appear upon the books of the company as trustees or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has not reason to believe that any other person, association, or corporation has any interest, direct or indirect, in the said stocks, bonds, or other securities than as so stated by him.

PETER P. PINTO, Business Manager.

Sworn to and subscribed before me this 16th day of September, 1949.
(SEAL) HERMAN CASAROFF, Notary Public.
(My commission expires March 30th, 1951.)

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Our products are engineered to fill every need in natural and synthetic rubber compounding wherever the use of vulcanized oil is indicated.
We point with pride not only to a complete line of solid Brown, White, "Neophax" and "Amberex" grades, but also our aqueous dispersions and hydro-carbon solutions of "Factice" for use in their appropriate compounds.
Continuing research and development in our laboratory and rigid production control has made us the leader in this field.
The services of our laboratory are at your disposal in solving your compounding problems
THE STAMFORD RUBBER SUPPLY CO.
STAMFORD, CONN.
Makers of Stamford "Factice" Vulcanized Oil Since 1900

Rubber Industry Employment, Payrolls, Wages and Hours

Employment — Thousands of Production Workers and Index (1939 = 100)

	1948				1949			
	All Rubber Products		Rubber Tires & Tubes		All Rubber Products		Rubber Tires & Tubes	
Month	Number	Index	Number	Index	Number	Index	Number	Index
Jan.	210	173.5	101	185.5	191	157.8	88	163.0
Feb.	208	172.0	99	182.4	187	154.5	87	159.5
Mar.	204	168.9	96	177.7	183	151.0	86	158.2
Apr.	198	163.8	93	170.7	179	147.8	86	158.1
May	195	161.1	91	168.5	174	144.2	84	155.5
June	195	161.6	92	169.4	172	142.3	..	....
July	191	157.7	91	167.6	...	....	..	....
Aug.	195	160.9	92	168.7	...	....	..	....
Sept.	197	162.8	91	168.6	...	....	..	....
Oct.	198	163.5	90	165.9	...	....	..	....
Nov.	199	164.5	91	168.2	...	....	..	....
Dec.	196	161.8	90	165.3	...	....	..	....

Note: Figures from June, 1947, to date have been revised to adjust them to levels indicated by Federal Security Agency data for 1946; revisions for January-May, 1947, will be shown later.

Payrolls — Production Workers Pay Rolls Unadjusted Index (1939 = 100)

	1947		1948		1949	
Month	All Rubber Products	Rubber Tires & Tubes	All Rubber Products	Rubber Tires & Tubes	All Rubber Products	Rubber Tires & Tubes
Jan.	386.3	416.3	354.9	344.4	320.6	294.5
Feb.	385.0	413.3	337.2	315.4	309.8	288.8
Mar.	374.3	397.3	320.6	292.4	298.4	287.8
Apr.	383.9	414.2	312.8	286.4	291.4	285.2
May	367.2	399.3	318.9	305.7	294.5	292.9
June	342.3	356.2	330.2	322.0	....	....
July	331.2	350.0	329.7	329.8	....	....
Aug.	337.6	355.5	347.2	341.0	....	....
Sept.	348.3	355.3	344.9	326.2	...	....
Oct.	354.4	354.7	345.5	318.2	....	....
Nov.	361.4	362.4	341.9	312.9	....	....
Dec.	373.6	365.6	332.7	299.6	....	....

Note: Figures from June, 1947, to date have been revised to adjust them to levels indicated by Federal Security Agency data for 1946; revisions for January, 1946, through May, 1947, will be shown later.

Wages — Average Weekly Earnings

	1947		1948		1949	
Month	All Rubber Products	Rubber Tires & Tubes	All Rubber Products	Rubber Tires & Tubes	All Rubber Products	Rubber Tires & Tubes
Jan.	$54.03	$59.78	$57.33	$62.72	$56.89	$60.78
Feb.	54.06	59.90	54.70	58.22	56.33	61.21
Mar.	52.97	58.05	53.24	55.54	55.61	61.56
Apr.	55.23	61.64	53.39	56.54	55.35	60.92
May	55.30	61.12	55.45	61.15	57.00	63.54
June	55.49	61.35	57.14	63.96	58.71	....
July	55.74	62.06	58.37	66.30	....	....
Aug.	55.92	61.15	60.47	68.29	....	....
Sept.	57.76	64.75	59.31	65.27	....	....
Oct.	57.62	63.78	59.19	64.82	....	....
Nov.	57.99	64.86	58.27	62.79	....	....
Dec.	59.47	65.74	57.68	61.10	....	....

Wages — Average Hourly Earnings

	1947		1948		1949	
Month	All Rubber Products	Rubber Tires & Tubes	All Rubber Products	Rubber Tires & Tubes	All Rubber Products	Rubber Tires & Tubes
Jan.	$1.330	$1.511	$1.444	$1.646	$1.501	$1.721
Feb.	1.331	1.517	1.421	1.613	1.502	1.723
Mar.	1.330	1.512	1.408	1.599	1.499	1.719
Apr.	1.397	1.608	1.412	1.603	1.504	1.721
May	1.416	1.622	1.424	1.636	1.512	1.740
June	1.419	1.615	1.439	1.651	1.533	....
July	1.445	1.640	1.472	1.684	....	....
Aug.	1.445	1.640	1.500	1.730	....	....
Sept.	1.447	1.661	1.504	1.732	....	....
Oct.	1.436	1.644	1.507	1.734	....	....
Nov.	1.453	1.661	1.508	1.735	....	....
Dec.	1.454	1.658	1.499	1.721	....	....

Hours — Average Weekly Hours per Worker

Month	1947	1948	1949	Month	1947	1948	1949
January	40.6	39.7	37.9	July	38.6	39.7	...
February	40.6	38.5	37.5	August	38.7	40.3	...
March	39.8	37.8	37.1	September	39.9	39.4	...
April	39.5	37.8	36.8	October	40.1	39.3	...
May	39.0	39.0	37.7	November	39.9	38.6	...
June	39.1	39.7	38.3	December	40.9	38.5	...

Source: U. S. Department of Commerce. Note: These figures are revised from time to time and the latest available issue should be consulted for the most accurate data.

Indexes of Production, Shipments and Inventory For The Rubber Industry

Production 1935-1939 = 100 (Based on man-hours)

Month	1947	1948	1949	Month	1947	1948	1949
Jan.	247	223	193	July	207	200	...
Feb.	246	215	188	Aug.	210	207	...
Mar.	239	205	182	Sept.	217	205	...
Apr.	234	200	177	Oct.	223	205	...
May	220	201	178	Nov.	225	203	...
June	216	205	179	Dec.	230	200	...

Shipments—Average Month 1939 = 100 (Based on $ Value)

Jan.	301	282	291	July	298	339	...
Feb.	326	289	283	Aug.	312	351	...
Mar.	332	252	285	Sept.	346	345	...
Apr.	320	312	287	Oct.	354	344	...
May	309	317	307	Nov.	354	322	...
June	322	342	...	Dec.	307	318	...

Inventory — Average Month 1939 = 100 (Based on $ Value)

Jan.	229	271	295	July	268	289	...
Feb.	241	283	300	Aug.	258	287	...
Mar.	253	302	302	Sept.	246	288	...
Apr.	270	293	303	Oct.	247	284	...
May	279	296	299	Nov.	242	288	...
June	277	295	...	Dec.	257	289	...

Source: U. S. Department of Commerce.

Various Compounding Materials Consumed by the Rubber Industry

Material	1942	1943	1944	1945	1946	1947	1948
Asphalt [a]							
Short tons	22,263	16,510	20,189	19,483	28,715	32,113	19,967
% of total	.006	.005	.006	.005	.007	.007	.004
Barite (Barytes):							
Short tons	6,334	8,000	10,000	10,000	20,000	17,000	18,000
% of total	3.6	3.9	2.9	2.1	4.4	3.1	2.85
Carbon Black:							
Short tons	147,974	236,737	369,015	402,193	470,732	471,790	424,038
% of total	88.5	90.3	94.6	95.5	95.3	94.3	91.0
Clay, Kaolin:							
Short tons	51,334	50,964	59,588	109,936	162,393	166,201	176,965
% of total	5.1	5.5	6.8	11.7	12.3	11.5	11.3
Clay, Fire & Stoneware:							
Short tons	5,000	10,259	7,160	7,800	12,951	17,970	15,480
% of total	0.1	0.2	0.1	0.1	0.2	0.2	0.2
Lead Sulfate, Basic:							
Short tons	89	131	268	200	.....	.....	.....
% of total	1.1	2.3	4.2	5.2	..	..	..
Lime:							
Short tons	1,381	2,039	5,634	7,170	3,193	589	.....
% of total	0.02	0.05	0.13	0.10	0.1	0.01	..
Litharge:							
Short tons	3,460	4,302	3,023	1,864	2,131	2,205	2,835
% of total	3.8	3.8	2.2	1.3	1.6	1.3	1.8
Lithopone:							
Short tons	1,047	1,078	726	977	1,607	3,085	4,192
% of total	0.8	0.8	0.5	0.7	1.1	1.9	3.0
Mica, Ground:							
Short tons	1,754	3,063	1,137	3,715	4,951	3,900	.....
% of total	3.7	6.0	2.2	7.1	8.0	6.0	..
Sulfur:							
Short tons	40,000	51,000	63,000	64,960	72,800	72,800	70,560
% of total	1.4	1.8	1.9	2.0	2.2	1.8	1.7
Talc [b]							
Short tons	40,487	48,994	51,833	63,758*	65,980	71,840	66,226
% of total	10.0	11.8	13.0	16.0	14.4	13.9	13.0
Zinc Oxide:							
Short tons	52,717	67,898	59,518	63,447	83,776	82,248	82,895
% of total	53.0	47.4	42.3	49.6	53.1	51.2	54.9

Source: U. S. Bureau of Mines.
Notes: (a) Solid and semi-solid products of less than 200 penetration. (b) Includes pyrophyllite and ground soapstone. * Revised.

Tamms MINERAL BLACK

A low cost filler
for Molded Rubber Products

- IMPARTS SUPERIOR PHYSICAL QUALITIES
- ACTS AS AN EXCELLENT REINFORCING FILLER
- HAS GOOD TINTORIAL STRENGTH
- GIVES ADDED PIGMENTATION

Will not float... Is not a greasy black

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RMP ANTIMONY

- ATTRACTIVE
- NON-DETERIORATING

for RED RUBBER

RARE METAL PRODUCTS CO.
ATGLEN, PA.

WILLS *TUMBLERS and TRIMMERS*

SUB-ZERO ROTARY TUMBLER
(Deflashing by Cold Tumbling)

HIGH-SPEED TRIMMER
(Machine Trimming of Rubber)

WILLS RUBBER TRIMMING MACHINE CO.
Division of
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Export Sales Handled by Binney & Smith Co., International

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"PIONEERS OF THE INDUSTRY"

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45 Years
In St. Louis

ALL TYPES OF
Sharp Edge
CUTTING DIES

Also an improved, effective hand operated die block scraper.

INDEPENDENT DIE & SUPPLY COMPANY
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***Rubber-Flo* is the answer for keeping molds clean**

... is a non-toxic, odorless mold lubricant especially developed to "lick" the problem of dirty, sticky molds.

A free sample will be sent upon request

PREVENTIVE MAINTENANCE CO. BRIDGEPORT 5, CONNECTICUT

GUARANTEED
REBUILT MACHINERY

MILLS, CALENDERS,
TUBERS, VULCANIZERS,
PUMPS, ACCUMULATORS,
MIXERS, PULVERIZERS,
HYDRAULIC PRESSES,
CUTTING MACHINES
Immediate Deliveries from Stock

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Replies to keyed advertisements will be forwarded to advertiser without charge.

Address all replies to Box Numbers care of RUBBER AGE, 250 West 57th Street, New York 19, N. Y.

POSITIONS WANTED

RUBBER CHEMIST well experienced in all phases of this industry (twenty years experience) seeks employment with progressive company. 45 years old, Ph.D., also interested in technical sales. Address Box 111-C, RUBBER AGE.

CHIEF CHEMIST, fully experienced in administration, direction and pursuit of research-developments, production and processing controls of all types of sponge rubbers and latex foams, including neoprene foams. Immediately available due to forced retrenchment. Location immaterial. Address Box 538-P, RUBBER AGE.

RUBBER ENGINEER: Fourteen years experience in product and process development and quality control on tires, tubes, mechanicals, hose and special items. Accustomed to accepting responsibility with good record of accomplishment. Desire connection with progressive organization. Age 42, married, employed. Available Jan. 1st. Address Box 559-P, RUBBER AGE.

LATEX FOAM COMPOUNDER: Wealth of experience with natural, synthetic and neoprene latices. Dispersion building from proven recipes; plant layout collaborator; electronic applications; Dunlop and Talalay processes. Ten years chemical work. M.S. degree. References. Address Box 563-P, RUBBER AGE.

RUBBER CONSULTANT: Available for special problems or part-time work. Experienced in large and small plant operations, compounding, trouble-shooting, etc. Will t vel anywhere. Located Akron, Ohio. All work confidential. Address Box 564-P, RUBBER AGE.

SUPERINTENDENT-CHEMIST

Now employed. Fully experienced in all plant operations. Compounding, mixing, calendering and curing. Heavy and light mechanicals. All kinds of molded and extruded goods. Expert chemist. Can handle help. Address Box 567-P, RUBBER AGE.

SUPERINTENDENT or FOREMAN: Twenty-five years experience in all rubber processes, molding and extruding. Also practical compounder. Prefer small shop. Age 41. Address Box 568-P, RUBBER AGE.

EXECUTIVE

Desires new connection. More than twenty years experience in mechanical plants. Estimating, costs, control, sales. Also familiar with all factory activities. Small or medium size plant preferred. Age 44.

Address Box 577-P, RUBBER AGE.

CHEMICAL ENGINEER: Age 36, married. Held responsible positions in quality control and development. Experience in reclaim rubber, asphalt, roofing and tile, asphalt and rubber dispersions, cement asbestos pipe, asbestos paper. Available October. Address Box 583-P, RUBBER AGE.

SOUTH AMERICA—United States citizen with several years residence in South America and many years of experience as rubber chemist and compounder, chiefly mechanical rubber goods in American factories, would like to return to South America. Experience includes several years as manager of small rubber factory. College graduate. Good knowledge of Spanish language. Replies in Spanish invited. Address Box 584-P, RUBBER AGE.

TECHNICAL RESEARCHER: Available right now. Over twenty-five years experience in developing and compounding, etc., of offset, news and direct printing rollers and blankets, made from synthetic and natural rubbers, resins and glue composition. Seeks position as researcher or plant manager. Can furnish the best of references. Address Box 587-P, RUBBER AGE.

PRODUCT DEVELOPMENT CHEMICAL ENGINEER desires employment with small or medium sized rubber or plastic manufacturer. Has practical experience in compounding and fabrication of articles made from synthetic rubbers, natural rubbers, rubber derivatives, rubber-resin blends, and vinyl resins. Has latest knowledge of solvent type cements, cord dips, self-sealing fuel cells, tape adhesives, molded goods, tank lining, and tires because of association with large and progressive company. Address V. G. Boger, 1235 Tulip Street, Akron 1, Ohio.

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TECHNICAL SALES REPRESENTATIVE for uncompounded latex and natural rubber. National distribution. Free to travel. Furnish full particulars in first letter. All replies treated confidentially. Address Box 574-W, RUBBER AGE.

CHEMIST: Rubber heel and sole experience. New England location. Address Box 575-W, RUBBER AGE.

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by old established rubber company manufacturing industrial specialties. Location: Metropolitan New York.

Position 1: RESEARCH DIRECTOR. Ph.D. or equivalent, with proven personal accomplishments in research and in direction of research staff. Should have broad experience in soft rubber including synthetic rubber. Also working knowledge of rubber manufacturing equipment. Rare opportunity for qualified man. Salary commensurate with qualifications.

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Only fully detailed replies stating age, education, experience, etc., will be considered. All replies confidential. Address Box 576-W, RUBBER AGE.

LATEX DIP SUPERINTENDENT
EASTERN LOCATION—SALARY $8-10,000

for a national company. Must have a strong background in the latex dip field, ability to handle factory personnel. Submit detailed resume. Replies confidential. SHAY AGENCIES, 30 W. Washington St., Chicago 2, Illinois.

SALESMAN for selling natural and synthetic latex compounds, vinyl polymer emulsions, for adhesives, saturants, binders, and laminants. Plant located in Eastern area. Address Box 581-W, RUBBER AGE.

EXPERIENCED FOREMAN: Preferable with background of compounding and development. Wanted by old established Eastern concern for department manufacturing molded, extruded, lathe cut, miscellaneous products and roll covering. Address Box 586-W, RUBBER AGE.

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SELL NOW! BEFORE PRICES DROP FURTHER! Wanted: Chemicals, Colors, Pigments, Resins, Solvents, Oils, Waxes, Lacquers, Other Materials, Supplies, Equipment, etc. CHEMICAL SERVICE CORPORATION, 84-04 Beaver St., New York 5, N. Y.

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√ UNCURED COMPOUNDS √ RUBBER **Scrap** √ POLYETHYLENE √ VINYL (PVC)

ROTEX RUBBER COMPANY INC.

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WANTED TO CONTACT: A manufacturer with medium to heavy manufacturing facilities to build and market a proven enclosed mixer used for the compounding of rubber and plastics. We know this machine to be a vast improvement over the Banbury which is now used exclusively for this work. This will prove a profitable item to those who are now engaged in the manufacturing of rubber and plastics working machinery, and might round out your line of equipment. We know there is a receptive market. Address Box 570-B, RUBBER AGE.

FOR SALE: Hard rubber sporting goods item. Address Box 573-B, RUBBER AGE.

WANTED: Complete latex foam rubber plant, operating presently, capable of producing quantities large sized items. Personnel retained where possible. Strictest confidence. Address Box 579-B, RUBBER AGE.

REPUTABLE FINANCIAL AND SALES ORGANIZATION with excellent sales contacts would like to acquire interest in going foam sponge plant. Replies held in strict confidence. Address Box 580-B, RUBBER AGE.

TO SUPPLIERS to the rubber industry: Manufacturer's agent with headquarters in Akron, selling to rubber companies in Ohio and surrounding states on a commission basis, can do an effective selling job on an additional product salable in volume to the rubber industry. Address Box 585-B, RUBBER AGE.

RUBBER PRODUCTS PATENTS, desired, large national mechanical manufacturer. Confidential. Complete details first letter.

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Master Batching
Mixing of all kinds

BESTREAD PRODUCTS CO. STOUGHTON, MASS.

EQUIPMENT WANTED

WANTED: Complete rubber plants. Also individual items such as: 2-roll mills, calenders, mixers and Banbury Mixers. R. GELB & SONS, INC., State Highway No. 29, Union, New Jersey.

WANTED

Two 60" heavy duty rubber mills, complete with 550 volt motors and drives.

One 3-roll rubber calender (48" or over) with 550 volt motor and drive.

Address Box 557-E, RUBBER AGE

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WANTED: DIPPING EQUIPMENT (Latex) by Midwest manufacturer. Give full details, descriptions, capacities, prices. Address Box 566-E, RUBBER AGE.

WANTED: Used Laboratory Mill, Scott Tester, Gravitometer, Press with electric platens 8" x 8" to 12" x 12", and 24" x 24" single opening hydraulic press. Advise price each item and location. Address Box 569-E, RUBBER AGE.

WANTED: One—250 HP or larger at 900 RPM HERRINGBONE REDUCER, 9 to 1 reduction. Must be in good condition and reasonable. Address Box 578-E, RUBBER AGE.

EQUIPMENT FOR SALE

SAVE WITH GUARANTEED REBUILT EQUIPMENT—Hydraulic Presses: Two 36" x 25", 15" ram, 265 tons; one 24" x 24", 18" ram, 318 tons; 26" x 24", 13" ram, 400 tons; 36" x 36", 19" ram, 425 tons; 24" x 42", two 12" rams, 340 tons; 26" x 24", 18½" ram, 800 tons; 24" x 24", 12" ram, 141 tons; 42" x 42", 16" ram, 250 tons; 36" x 52", 14" ram, 385 tons; 36" x 36", 12" ram, 141 tons; 20" x 20", 10" ram, 118 tons; 19" x 24", 10" ram, 78 tons; 22" x 15", 8" ram, 75 tons; 15" x 15", 8" ram, 75 tons; 12" x 12", 7½" ram, 50 tons; 12" x 12", 6½" ram, 42 tons; 8" x 9½", 4½" ram, 20 tons; 16" x 16", 3½" ram, 12 tons. Laboratory Press: 6" x 6", 30 tons. New Dual Pumping Units, all sizes: Worthington Triplex 12 gal., 2,200#; 4 plunger, 6 gal., 2,000#; Watson-Stillman duplex box type, 1 gal., 2,500#; Worthington 1 gal., 10,000#. New Laboratory 6" x 12" M.D. Mills; Thropp 16" x 40" M.D. Mill. Extruders: Royle No. 2 M.D. Pretorm Machines: Stokes R & T; Colton 5 and 5½T; 2 Stokes DDS 4 with Reeves Drives. Mixers, Accumulators, Vulcanizers, etc. UNIVERSAL HYDRAULIC MACHINERY COMPANY, 285 Hudson St., New York 13, N. Y.

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Farrel 30 x 8 two-roll, excellent condition, old type	$950.00
Farrel 12 x 18 four-roll, herringbone gear, 1943	Offers

MIXERS

Day Bread Mixers, tilting type, motor driven, 7½ HP	350.00
Hobart batter mixer, gear-motor driven, 1 HP	250.00
Farrel spike mixer, 200 gallon, tilting, jacketed	350.00
Ross Paddle mixer, vertical, 75 gallon, 8 blades	80.00

PRESSES

Watson-Stillman, Hydraulic Lab., 60 ton, and hand pump	350.00
Dunning & Birdsboro, Hydraulic, 60 ton, new 1941	350.00
Southwark, Hydraulic, 350 ton, rebuilt, platen 24" x 42"	1750.00

EXTRACTORS

Tolhurst & Troy, new, used only 3 months on rubber washing and drying, industrial, 50" diam., 29" and 20" deep, with spray nozzles in top lid for washing and drying in the same operation, 7½ HP, 220/440 volt, each	1500.00

HYDRAULIC PUMPS

Loewy, 2500 lb., 270 gallons, new 1944, photos	8500.00
H.P.M., 2200 lb., 20 gallons, with tank, 1942	900.00

MISCELLANEOUS

Cleveland, 75 HP worm gear reducer, 26 ½ to 1	650.00
Farrel, 500 HP gear reducer, 5 to 1, new, 1942	3500.00
Toledo continuous weighing scale, Model 9500	450.00

EVEREADY SUPPLY COMPANY (E. J. McCallum, Jr., Prop.), 805 Housatonic Ave., Bridgeport 4, Conn.

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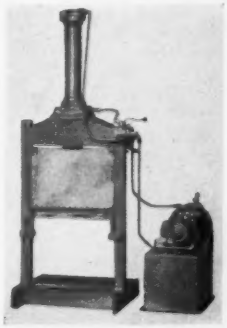

Complete self-contained unit with Vickers Pump, tank for 30 gal. oil and 5 H.P. motor.

Knife—30" width
23" stroke

Floor space—36" x 64"
Height—8'5"

Guaranteed perfect working. Safety built throughout for operation.

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